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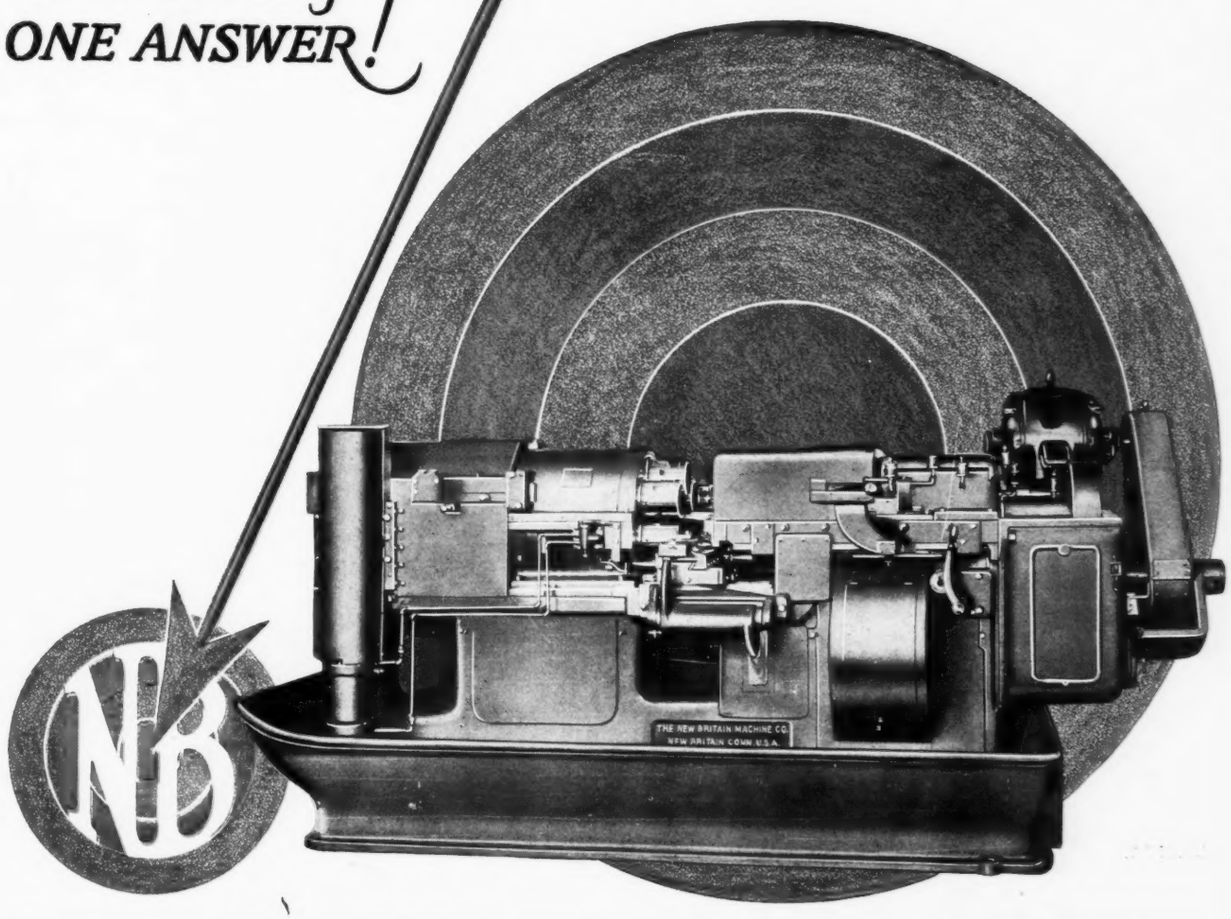

NEW BRITAIN NEW-MATIC

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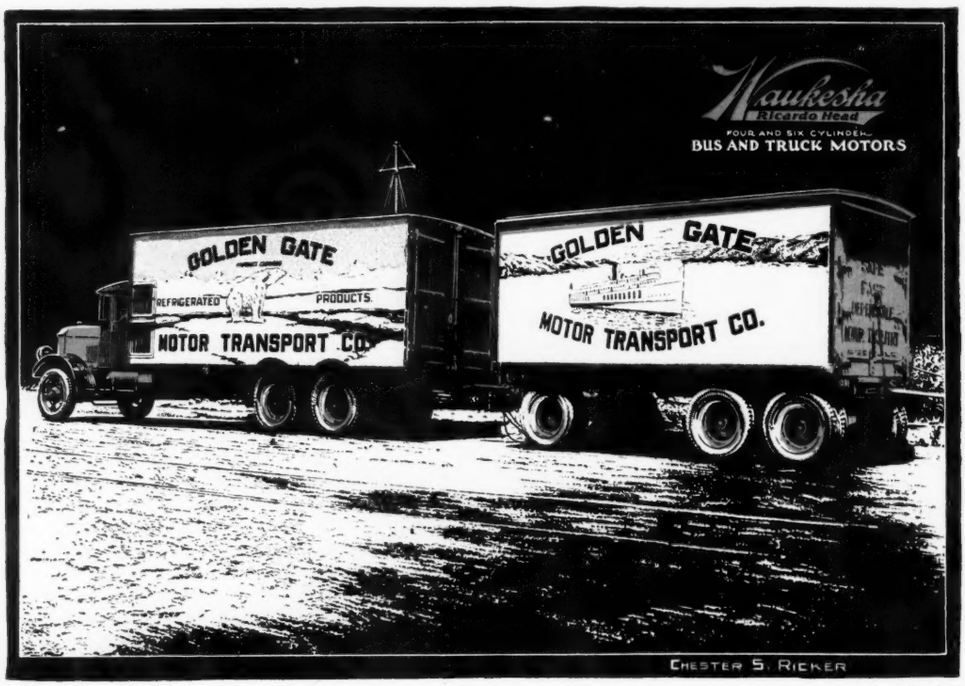

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Fifty Waukesha-engined Fageol trucks are operated by the Golden Gate Motor Transport Co. of San Francisco. These six-cylinder, six-wheel, ten-ton trucks with ten-ton trailers are used to transport perishable foods. Although they are provided with an automatic refrigerating system they must make rapid runs and real power is required to assure "on time" arrival of each load.

Six-cylinder 100 *H.P. Waukesha "Ricardo Head" engines are used in these refrigerator Fageol trucks. A. O. Stewart, President of the Golden Gate organization says: "We have been honored with the government contract for all hauling for the Mare Island Navy Yard and the Fageols are serving us splendidly in this work." If you require a heavy duty engine for truck or bus service, you will find a Waukesha available. Seven sizes from* 50 *to* 125 *H.P.*

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AUTOMOTIVE INDUSTRIES
VOLUME 58 *Philadelphia, Saturday, March 17, 1928* NUMBER 11

Export Progress Continues on Sound Basis

American automotive products pushing way into foreign markets in increasing volume despite vigorous competition from other producing countries, and tariff obstacles.

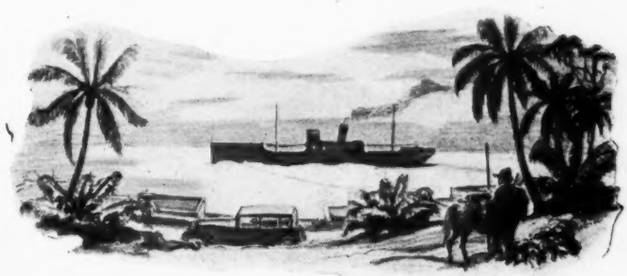
By John C. Gourlie

THE export business in American motor cars and commercial vehicles presents today a fascinating panorama of progress and change. The vigorous efforts being made by other producing nations to build up home and export markets have had some effect, but losses in a few territories have been more than counterbalanced by gains in others, and the general situation is a hopeful one.

The fact that exports of complete vehicles gained last year while production was undergoing a serious decline emphasizes the constantly growing importance of the overseas markets, especially as Ford's inactivity undoubtedly held down the total of foreign shipments. Probably more attention is being given to export problems by the chief executives of American companies than in any previous period since serious attempts to build up foreign sales were initiated by the industry.

Chief among current questions of interest in the foreign field are tariff obstacles and recurrent proposals for cooperative control of European markets by British and continental producers. Broadly speaking, these problems are viewed by American manufacturers in the light of what is best in the long run to the advantage of motor transportation, holding that measures which will encourage the ownership and operation of motor vehicles will react favorably on all producing interests to a greater or less degree.

Although it would be over-optimistic to say that these views are accepted universally, the fact remains that any restrictive measures so far taken have not interfered with the healthy expansion of world registrations, nor have American manufacturers failed to obtain a fair share of the world's annual business. Furthermore, there does not seem to be any immediate likelihood of an international cartel of automobile producers or of the adoption of other proposals with similar intent to apportion European markets, despite the persistence with which they are brought forward.



The most recent plan along these lines was presented at a meeting last November of the *Bureau Permanent*, an association uniting the automobile manufacturers' associations of all countries, including the United States. It was established for the purposes of development of the world's automobile industry, of removing restrictions on the growth of the industry, of united action for the benefit of all its members and of international standardization.

"Contingent Scheme" Proposed

The proposal of the Italian delegate at the November meeting of this body was that European makers should adopt what he described as a "contingent scheme." Under it, the United States should be allowed to export a certain maximum number of automobiles to various European countries, whether automobile producing countries or not, and in return, should allow European makers to export a determined number of cars to the United States. Thus the American industry, instead of being an unknown force, would be held within predetermined limits so far as the European market was concerned.

George Bauer, the American delegate, representing the National Automobile Chamber of Commerce, opposed the scheme on the principle that it was restrictive and not constructive. The industry is against all schemes which will limit the market, either for American producers or for others. It would help in every scheme seeking to expand

the markets, but it would present strong opposition to anything of a limiting character, whether the United States would be directly affected or not.

Other opposition developed, and nothing came of the proposal. The same is true of a tentative German plan for a European cartel and various suggestions made in France by individual manufacturers. Mussolini is said to favor European cooperation in some form or other and doubtless has the Italian industry in back of him.

In all such plans there are practical difficulties to be overcome. England has shown no disposition to favor them, being occupied with development of plans for stimulating business in the markets of the Empire. French manufacturers in the main are strongly individualistic and the tendency appears to be for the big firms to absorb the smaller ones, rather than to enter upon cooperative schemes in which all would share to some extent.

Plenty of Opportunity

As a matter of fact, business is good with so many of the European producers that cooperative plans are likely to appeal more to the weaker than to the stronger elements. There is plenty of opportunity for profits and for expansion for companies that are strong financially and capably directed.

Especially does this appear true from consideration of the growth of registrations in countries outside the United States. This advance has been proceeding at a regular rate in recent years, and the rate is high. Registrations in 1927 were about 17 per cent greater than the previous year, and at the beginning of 1928 were 18 per cent greater than a year ago. In figures the gain was 923,643 in 1927 against 853,679.

The gain in combined United States and Canadian exports of complete cars, while gratifying in the view of the Ford situation, was only 62,000 units. If foreign assemblies not otherwise reported are included in the figures for 1926 and 1927, there was an actual decrease last year in foreign business, but as the assemblies are in the main Ford production, the comparison on number of complete cars exported is probably more significant. The actual and percentage increase was greater in the case of trucks than it was in passenger vehicles.

Complete figures on how European countries fared in 1927 are not available, but one estimate is that the gain in production by the overseas group was 10 per cent as against 1926. Great Britain alone turned out 228,500 cars, it is estimated, against 170,000 in the previous year. German production is given as 66,000 compared with 55,000, while others were stationary or lost ground slightly, due mainly to the influence of currency stabilization.

The German situation is particularly interesting. Motor car exports from the United States alone to Germany last year were 8474 vehicles, against 3220 the year preceding. Yet German producers were able to share generously in what amounted to a major expansion of the market.

This year, as the result of legislation changing the basis for the import duty on car and truck parts, there has been a slight increase in price schedules of American cars in Germany. Referring to these matters, the Berlin correspondent of *The American Automobile* (Overseas Edition) writes as follows:

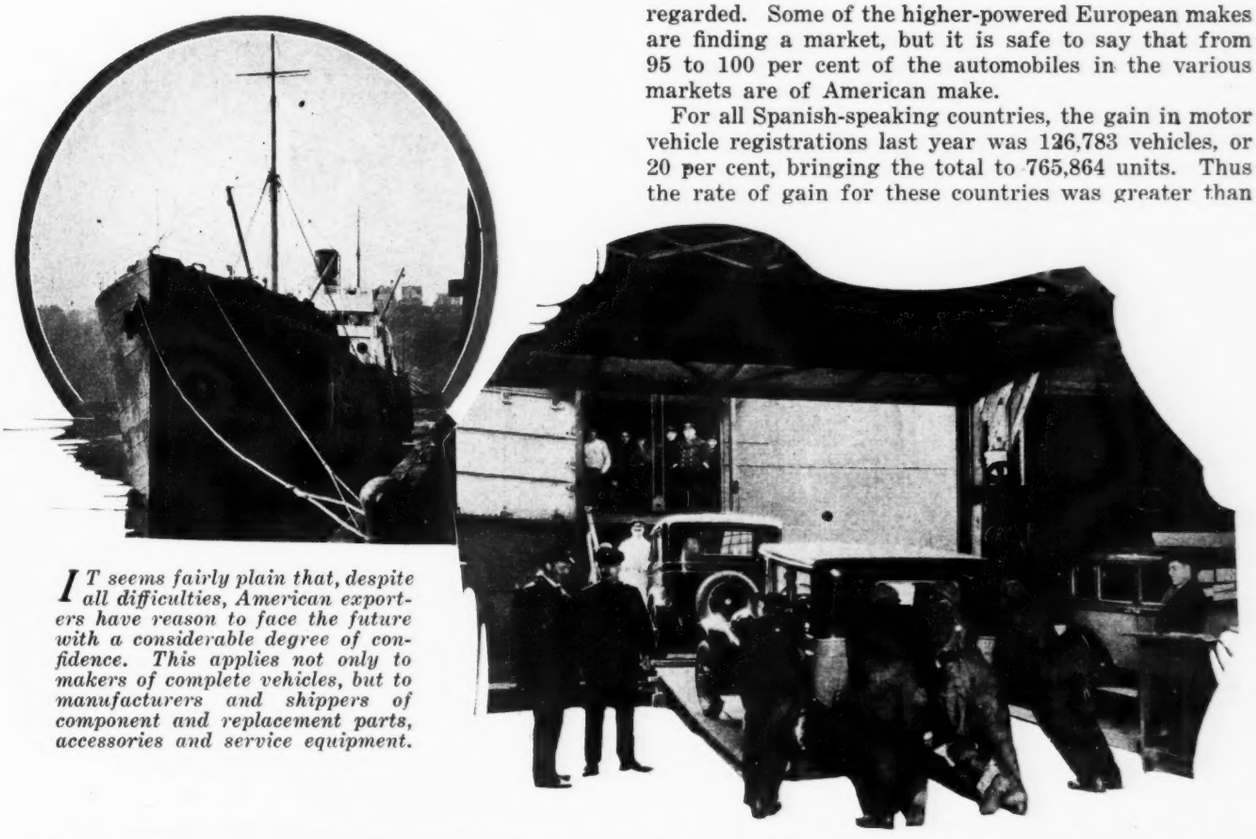
"Naturally, it may be assumed that less parts will be shipped from the United States to Germany during the current year and the gradual tendency will be to produce as many parts or units as possible here. In other words, since there is no longer the same incentive to ship small parts to Germany, the practice doubtless will be to import mostly complete units, motors, differentials, frames, etc."

So, while everything does not go smoothly, there is usually some compensatory element for the exporter. In this connection developments in New Zealand are worth watching, for in this market the British preferential tariff policy has been operative for more than a year, the increased duties having been made effective in 1926. Import statistics covering all cars and trucks for three years have been reduced to percentages by *The American Automobile* as follows:

Origin	1925	1926	1927
United Kingdom	15.7	15.0	19.1
Canada	44.1	33.	25.8
United States	37.7	50.7	54.3
American	81.8%	83.9%	80.1%

Comparison of U. S. and Canadian Motor Vehicle Exports to Leading Overseas Markets

	Total Automobiles		Cars		Trucks	
	1927	1926	1927	1926	1927	1926
Australia	73,649	80,661	47,762	60,375	25,887	20,086
Argentina	46,474	31,566	35,918	29,091	10,556	2,475
New Zealand	8,235	18,791	6,774	15,588	1,461	3,203
South Africa	23,109	20,087	19,354	17,158	3,755	2,708
India	17,075	15,043	9,518	9,452	7,557	5,591
Sweden	6,811	4,222	5,971	3,855	840	367
Brazil	26,017	23,669	14,956	17,783	11,061	5,886
United Kingdom	23,900	14,944	18,131	9,040	5,769	5,904
Japan	3,726	2,873	3,266	2,550	460	323
Spain	10,721	7,398	7,518	5,151	3,203	2,247
Portugal	1,903	1,034	1,288	908	615	126
Mexico	7,839	12,124	6,098	9,921	1,741	2,203
Cuba	6,409	6,744	4,567	4,835	1,842	1,909
Uruguay	4,830	6,916	3,679	5,507	1,151	1,409



IT seems fairly plain that, despite all difficulties, American exporters have reason to face the future with a considerable degree of confidence. This applies not only to makers of complete vehicles, but to manufacturers and shippers of component and replacement parts, accessories and service equipment.

On the whole, however, as the feeling for "protection" against the American "invasion" is running high in European production centers, the fact is generally being faced that obstacles to sales in some territories will tend to increase rather than decrease. An evidence of the spirit in several quarters may be seen from the rules covering exhibition in the Paris automobile shows.

Under the rules foreign exhibitors are on the same footing as French firms if they have taken part in three previous Paris shows and if their national import duty previous to 1914 was not in excess of 15 per cent ad valorem. Before the war the United States was the only nation having a duty on automobiles higher than 15 per cent, and consequently is the only one affected by this rule.

American exporters, in view of these and other evidences of a desire to restrict American participation in some foreign markets, are disposed to look for greatest continued expansion in the countries not subject to restrictive measures and to be grateful for whatever in the way of increased business may be obtained along with European producers in the territories under the direct influence of the manufacturing nations overseas.

How this policy is working out may be seen by the comparisons of shipments to various important export markets given in the accompanying table. The principal field for expansion, of course, lies in Latin America, where the potential market for cars is almost unlimited, viewed in connection with the present comparatively meager business. The important consideration of the future is the building of roads, and this is proceeding at an accelerated pace. Concerning Latin America, *El Automovil Americano* reports as follows:

"Throughout the Americas, Central and South America and the West Indies, the automobile business is so predominantly American that, in general, the European competition on cars and trucks may practically be disregarded. Some of the higher-powered European makes are finding a market, but it is safe to say that from 95 to 100 per cent of the automobiles in the various markets are of American make.

For all Spanish-speaking countries, the gain in motor vehicle registrations last year was 126,783 vehicles, or 20 per cent, bringing the total to 765,864 units. Thus the rate of gain for these countries was greater than for all countries exclusive of the United States. According to the best information available, the total of sales and assemblies in Spanish-speaking countries was 156,644 American cars and trucks, in addition to some thousands of European vehicles sold principally in Spain, Portugal, Brazil, Argentina and Uruguay. The figure for American cars, while not exact, is the best that can be given. It includes shipments from the United States and Canada, together with estimates to cover additional assembled vehicles. The comparable figure for 1926 was 164,010. From this it is evident that the Ford loss last year was nearly made up by other producers.

It seems fairly plain that, despite all difficulties, American exporters have reason to face the future with a considerable degree of confidence. This applies not only to makers of complete vehicles, but to manufacturers and shippers of component and replacement parts, accessories and service equipment. Special considerations cover these fields but here again progress is being made.

The disposition of some European producers to use American equipment units has already been commented upon in *Automotive Industries* and further developments along this line are looked for in 1928. Last year replacement parts exports made the most striking gain, rising more than 30 per cent to a total of $50,274,867. Accessories had a slight falling off, probably due largely to the practical cessation of Ford car distribution abroad but influenced no doubt by the greater amount of equipment placed on cars as original equipment by the car makers. The gain by service equipment makers was about 15 per cent.

The after-market, therefore, is not being neglected, and there seems no reason not to look for further increases in foreign business covering parts and equipment, as well as in complete car and truck units.

Rubber Outlook Hinges *on* Future Policy *of* England

Indication now is that restriction will be lifted, insuring adequate supply of crude and lower prices.

By A. B. Crofoot

ANY consideration of the outlook in crude rubber for the next few months immediately focuses on the questions, Will the British remove their restriction regulations, or, if not, will they get together with the Dutch on some new kind of joint restriction scheme? That the former possibility is seriously considered is proved by the fact that the recent announcements made by Premier Baldwin were followed immediately by decided slumps in the price of crude rubber in London and New York.

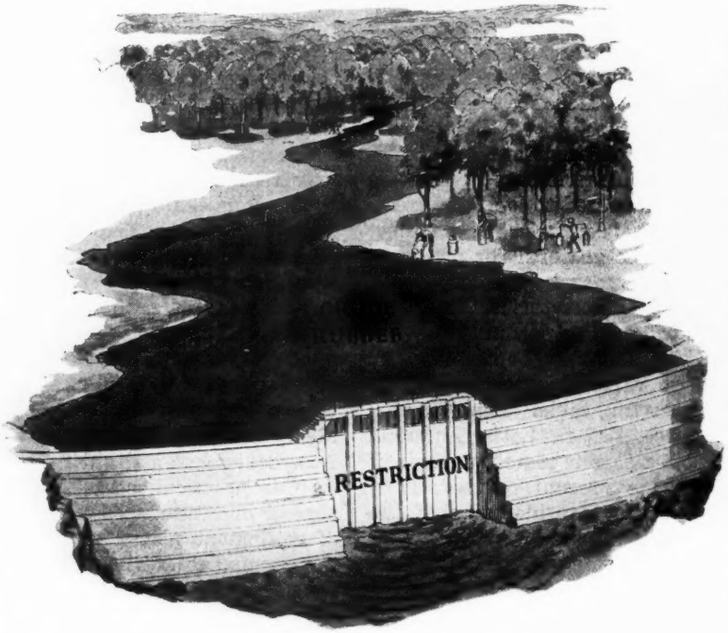
Market reports put out by brokers on both sides of the Atlantic lay particular emphasis in such a possibility. Several of the British newspapers, on the other hand, are prone to look on restriction abandonment as rather unlikely. When it is considered that the British plantations are now operating on their fourth consecutive quarter with an export allowance of 60 per cent of their "Standard Production," and that this standard has just been reduced in Malaya by about 16 per cent, it can readily be understood why such importance is attached to the likelihood of restriction abandonment. It might be well, therefore, to consider first this aspect of the situation and its possibility.

Avowedly a scheme for the maintenance of prices, and evidently one that has been fairly successful in its aim, the Stevenson Restriction Act is regarded as largely, if not solely, responsible for the level at which prices were held during 1927. Its abandonment would release to the market a vast increment of rubber and the effect would doubtless be a lowering of prices. According to some estimates of the probable output and consumption during 1928, the abandonment of this scheme would make the difference between overproduction and underproduction during the current year.

That the British cabinet realized the probable effect on prices is witnessed by the form in which its announcement was made. At the beginning of February the announcement came from the Cabinet, rather than from the Colonial Office as heretofore, that the export allowance would remain at the same figure for the next quarter as it was for the previous quarter, and on Feb. 9 that a special investigating committee would be appointed to review the advisability of continuing the restriction scheme. The effect on the market was immediate, but it gave traders some time to anticipate the possible abandonment before it actually went into effect, and the market was not demoralized to the extent that it might otherwise have been.

That the results of the committee's investigation are commonly expected to be in favor of abandonment is demonstrated by the fact that there has been no appreciable rally since the first announcement came out. On the contrary, the price has been fairly steadily declining since then.

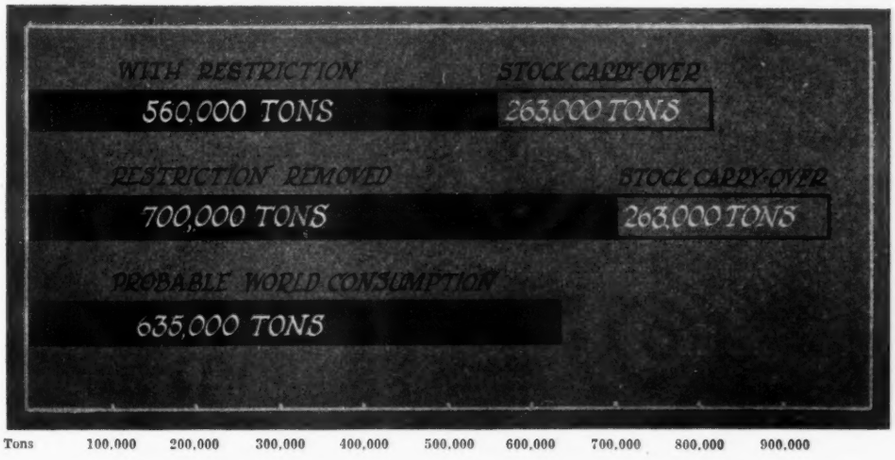
Just what will be the effect of this abandonment if it takes place? Although estimates vary over a very wide range, figures given out by F. R. Henderson & Co. place the probable production for 1928 at 560,000 tons, with a carry-over of world stocks of 263,700 tons, or a total available supply of 823,700 tons, and a probable consumption, allowing for normal growth, of 635,000 tons. Restricted British plantations will probably contribute about 46 per cent of the expected output, under restriction, roughly 250,000 tons. If, however, restriction is removed, permitting British plantations to export their whole output instead of just 60 per cent, their contribution would be raised by about 160,000 tons. This in turn would bring the total world production up to 700,000 tons — more than enough to meet the probable requirements of the year.



Will the gate be lifted?

It must be borne in mind, however, in considering the possibilities of restriction abandonment, that the assessments of many of

Estimated 1928 World Rubber Supply With and Without British Restriction



As will be seen from this chart, which is based on the figures of F. R. Henderson & Co., the probable consumption of crude rubber in 1928 will run ahead of production and eat into the stock carry-over unless the restriction on exports from British plantations is removed. Without restriction, however, the production will more than equal the demands of consumption

the plantations have been unduly high. Even under the drastic cuts in assessments recently made in Malaya, some market authorities are of the opinion that few, if any, of the plantations will be capable of producing more than they have been assessed. In fact it has been stated that some of the plantations heretofore have been able to export their whole output and still come within the 60 per cent of their assessed standard production. So that, if the restriction provisions are removed, the supply made available will not be quite as great as might be assumed. On the other hand, some people are of the opinion that the latest assessments are below actual capacity. That such an occurrence would considerably enhance the available supplies, however, cannot be doubted.

There is some talk that restrictionists are trying to save the day for themselves by negotiating with Dutch producers for a joint restriction scheme. Another possibility suggested is that after the restriction law is repealed, always presuming that that will be the result of the investigation, a temporary measure be substituted or a voluntary restriction scheme be entered into so that the market will be let down easily.

The former of these possibilities is regarded by some as the stake for which the British are playing in their talk about restriction abandonment. It is true that the Dutch, in some ways, will have more to lose if the British do abandon their restriction than will the British, and this recent agitation is regarded by some as merely a bit of clever sideshow on the part of the British to force the Dutch into some sort of restrictive cooperation. Advices from the Dutch plantations indicate that any such policy, if adopted by the Dutch, would be voluntary on the part of plantation owners and not a government matter. Any voluntary restriction, however, would have to be entered into almost 100 per cent in order to accomplish its purpose, and this participation would be difficult to obtain without compulsion.

Although restriction has accompllished its purpose to a certain extent, the result has in some ways been rather costly to those who brought it about. Under restriction, there has naturally been little inducement for the British planters to expand their areas under cultivation, and there have been a few cases where plantations have been allowed to return to the wild. On the other hand, the Dutch have been only too willing to take advantage of the high prices artificially maintained by their British neighbors, and have expanded their plantations rapidly. It is estimated, for example, that Dutch plantations during the past year expanded perhaps as much as 50,000 acres.

Restriction Production Drops

In 1925 Dutch yield had increased to around 300 pounds an acre. If this figure can be taken as characteristic, these 50,000 acres should be yielding about 6700 tons when they come into production about six years from now. In addition to this, natives in Dutch East Indies have also been planting isolated areas throughout the territories and these too will increase the total Dutch output. Correspondingly there will be new areas coming into production during the intervening years, as plantings have gone on apace during the period of British restriction. As a result of this tendency the British plantations have lost place in the control of the market, slipping from 67 per cent prior to the inauguration of restriction to somewhere around 46 per cent last year. Some authorities place restriction production as low as 38 per cent.

It is a question whether the price obtained by the British for their rubber during the years will repay them for the business thus lost to the Dutch and native growers in non-British territory. Of course the Dutch and independent growers will have to bear their share of the subsequent loss in profit if the British restrictions are removed, but this restriction has already done much to destroy the British lead.

Another aspect to be considered in case of restriction

abandonment is a suggestion that several of the plantations may enter into large mergers. This suggestion has actually been made, and, while it is offered here for what it is worth, it has distinct possibilities. If some of the plantations should merge, this would undoubtedly result in increased efficiency in management, reduced overhead and other economies which would make profits possible at lower prices.

The estimates previously given for production and consumption in 1928 are those of one factor in the New York market. Other estimates vary, in some instances considerably, from those given. The total production capacity of the restricted plantations alone is variously estimated at from 385,300 to 427,000 tons, with the majority of the estimates ranging around the lower figure. Of this amount 75,300 is the standard production for Ceylon. Estimates for total world capacity production for the year vary from the 575,000 tons mentioned by F. R. Henderson & Co., and concurred in by Faulkner Winsor & Co., London, to 700,000 tons. In any event, with the 263,000 tons stocks on hand, there should be more than sufficient to meet the estimated needs for 1928 of 635,000 tons, even should this figure prove 25,000 tons below actual consumption, as was the case last year. Incidentally, this figure of 635,000 for 1928's needs is the top figure, estimates ranging from 585,000 up to this level.

Futures Discounted

One actual result that has already made itself felt as a consequence of the possibility of restriction abandonment is the fact that futures for 1929, which were selling at a premium have lately been markedly discounted. One British house gives the following estimates for production in the next four years, based on a continuation of the 60 per cent restriction: 1929, 605,000 tons; 1930, 635,000 tons; 1931, 665,000 tons; and 1932, 680,000 tons. This house is among those making conservative estimates in other cases, so that any value attached to its figures is thereby enhanced. In considering these figures, it should be borne in mind that there is no way of gaging accurately the amount of "wild rubber" actually available, as the output of this type is dependent rather on the incentive for its procuring than upon the number of trees planted, as is the case in the plantations.

British plantation owners generally want some change in the system of control. They feel that they have been "holding the bag" long enough. While they have been enabled to obtain higher prices for such of their production capacity as they have sold, they have had to stand aside and watch the Dutch plantation owners and the independents absorb ever growing portions of their business. A number of meetings were held toward the end of last year among the plantation owners at which resolutions were drafted requesting the elimination of restriction.

Should restriction be retained, which possibility has as ardent supporters as the one that it should be abandoned, there is one factor that no longer enters into the picture. Heretofore plantations operating under restriction were issued coupons for their exportable allowance every quarter, and such as were not used during that quarter were allowed to accumulate and could be used at future dates. Under this system, estimates of quantities available had to include unused coupons, and these at the beginning of last year amounted to about 41,000 tons. During the year, these were worked down until at the end of the year they amounted to only a little over 10,000 tons. Also during the year the operation of the restriction scheme was amended so that coupons issued were good for only a six-months period.

In other words, coupons issued for one quarter must be used up before the end of the next succeeding quarter or become void. And further, those issued for one quarter cannot be used during the next quarter unless all those issued for that quarter are used up first. Under the new arrangement the restriction scheme becomes more real restriction, and unused coupons can no longer accumulate to such an extent as to become vital factors to consider in gaging the market.

American Plantations

In studying future rubber supplies some attention must also be given to the efforts of American interests to develop their own plantations. Chief of these experiments is the United States Rubber Company's plantations, on which were produced last year around 25,000,000 pounds of crude. This company has been experimenting and developing so that production is now equivalent to around 500 pounds per acre per year, and it is hoped that this can be stepped up still further to reach 1000 pounds a year.

H. S. Firestone's experiments in Liberia have not yet reached sufficient proportions to become factors in the market. Although he has a 1,000,000 acre tract, and he claims to secure 500 pounds a year an acre from such of his land as is in production, he still has comparatively little of it under cultivation. Ford's Brazilian endeavor is still more or less nebulous.

Another factor that is growing to considerable importance is the increasing use of reclaimed rubber. The United States last year used practically 47 tons of reclaimed rubber for every 100 tons of crude. Great Britain also showed considerable growth of interest in the use of reclaimed rubber last year, but its use there has not yet reached the significance that it has in this country. How much further the use of reclaimed rubber can grow is problematical, but it cannot help but have its effect on the market for crude.

While information as to the activities of the American buying pool is unavailable, it is generally thought that this was comparatively inactive during the past year. Formed for the purpose of preventing if possible too violent fluctuations in the price of rubber, it had little occasion for activity during the year. If restriction be removed, and prices decline markedly as a result of this, the pool can hardly hope to stem the tide by buying up, even though America is the largest consuming market. Much as it might like to prevent too rapid and violent declines in price in order to protect its members from inventory losses, it is doubtful if it could buy sufficient quantities to prevent a price fall caused by placing on the market all the available crude rubber supplies.

Synthetic Rubber

The question of synthetic rubber as a factor in the immediate future can be passed over with very little comment. Some stir was created late last year by an announcement that Germany was ready to produce synthetic rubber commercially, but on investigation this was found to be more smoke than fire.

All factors considered, it seems extremely unlikely that there should be any shortage in crude rubber for several years, although the present price situation is rather delicate. On the contrary, there is talk among the British growers of developing new channels for the use of rubber and some hope is expressed by them that if restriction is removed, and prices decline sufficiently, crude rubber will regain some of the market recently surrendered to reclaimed.

Frames Produced *Automatically* in *Two*-Hour Cycle

Total time required from raw material to enameling of finished product in A. O. Smith plant is 1 hr. 50 min. Details of operation are described at Detroit S.A.E. meeting.

By A. F. Denham

MANY details relating to the automatic production of automobile frames in the plant of the A. O. Smith Corp., Milwaukee, Wis., were made public for the first time in a paper presented by John P. Kelley, sales manager of the corporation, at the February meeting of the Detroit Section, Society of Automotive Engineers.

While this plant has been in use since 1920 and the general principles involved in its layout are fairly well known to automotive executives, details of operation and methods of material handling have never before been disclosed. The talk was supplemented by motion pictures.

In practice the entire plant works as a single mechanical unit synchronized and co-related from the feeding end of the sheet steel to the emerging of the completed frame. One of the interesting features is that practically any size and type of automobile frame can be produced, only about 10 hours for 200 men being required to change over the plant from the production of one to another type and size. The plant has a daily capacity in excess of 7000 frames.

Factors which made such a plant possible were the development of new features of tooling and methods of production in the years preceding the plant's construction, outstanding among which are:

1. The cold riveting of frame assemblies, and the development of cold rivets of the proper quality for this purpose.

2. Flexible blanking and piercing dies, followed by the development of semi-flexible blanking and piercing dies, which not alone effected a considerable saving as compared with the cost of the solid blanking and piercing dies but which are also a big time saver, especially on initial runs involving new tooling.

3. Vertical off-setting of side bar blanks for the kick-up for rear axle clearance, also for the front and rear end drops, which effected an appreciable reduction in blank sizes and which made possible the economical use of high carbon strip steel.

4. Forming the end laps of cross bars automatically with the drawing or channeling operations.

The construction of this plant presented a huge engineering problem, since there was no installation in existence which could be used as a guide, and it was necessary to synchronize 552 operations for the average frame, at a desired speed of 360 frames per hour, aggregating approximately four million operations in the day's production of 7000 or more frames.

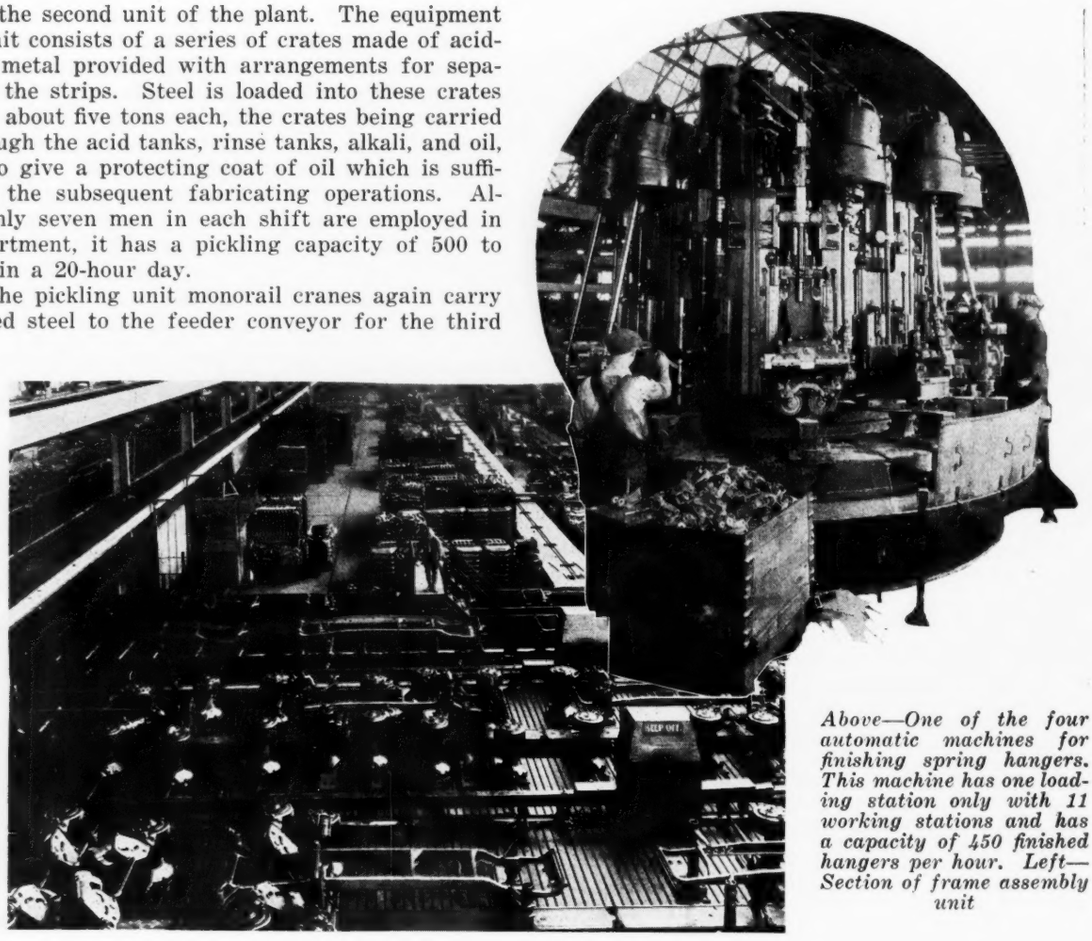
As in operation at present, including changes and improvements which have been made from time to time since the construction of the plant, material goes through the following operations in the production of finished frames: First, the sheet steel passes through an automatic inspection machine which rolls the steel to remove curvature, and automatically inspects it for size. All of the tonnage for side bars and most of it for cross-members is in strip steel and the automatic inspection machine measures and stacks this steel according to predetermined sizes, measuring the steel for length, width, thickness, and curvature, and rejecting all pieces not conforming to specifications, automatically on separate piles. It has a capacity of 900 strips per hour.

50,000 frames in outdoor storage at the A. O. Smith plant. This represents one week's production

From the inspection machine the steel is conveyed by monorail crane to the pickling department,

which is the second unit of the plant. The equipment of this unit consists of a series of crates made of acid-resisting metal provided with arrangements for separation of the strips. Steel is loaded into these crates in lots of about five tons each, the crates being carried then through the acid tanks, rinse tanks, alkali, and oil, the last to give a protecting coat of oil which is sufficient for the subsequent fabricating operations. Although only seven men in each shift are employed in this department, it has a pickling capacity of 500 to 600 tons in a 20-hour day.

From the pickling unit monorail cranes again carry the pickled steel to the feeder conveyor for the third



Above—One of the four automatic machines for finishing spring hangers. This machine has one loading station only with 11 working stations and has a capacity of 450 finished hangers per hour. Left—Section of frame assembly unit

unit, which is the side bar manufacturing line. This conveyor is of the reciprocating type. There are six presses which straddle this line, all driven by a single motor of 500 hp., with the following operations:

1. Vertical off-setting of blanks for kick-up of the rear axle; also for front and rear end drops. Since right and left-hand side members are of the same contour both are handled in the one vertical off-setting press.

2. The conveyor carries the member directly on to the piercing presses, of which there are two types, one for the left-hand and one for right-hand bars. The conveyor is so designed that alternating bars are passed through the first press and on to the second, so that the single conveyor unit is capable of handling both side members.

3. From the piercing presses the conveyor continues to the blanking presses for both left and right-hand bars, and further to the forming presses, of which of course there are two, one for left and one for right-hand members. Here again the conveyor carries alternating members through the first press, delivering left and right-hand bars to their respective forming presses. The capacity of this unit is 900 bars per hour.

Pickled steel for cross-members at the same time has been conveyed by monorail crane to the cross bar manufacturing and parts assembly line, which forms unit No. 4 of the process. There are four lines in this unit, each driven by a single motor of 100 hp., each line consisting of a blanking and drawing press, automatic piercing machines, and a number of smaller power riveting presses, the latter being required in some cases for the completion of cross bar sub-assemblies. The provision of automatic piercing machines in this line is to take care of piercing all holes which might be subject to distortion in the drawing operations, and only such holes are pierced therein, all others, which can be correctly and conveniently placed in the members, being pierced automotically with the blanking operation. End lapping of cross-members is performed simultaneously with the forming operation. It should be mentioned that reciprocating feeder conveyors are also used on these lines, feeding to the conveyors themselves being automatically performed. Each line of this unit has a capacity of 450 pieces per hour. Finished cross-members are ejected on transverse conveyors which then carry them direct to the general assembly line.

Finishing and Parts Assembly

Before the side members reach the general assembly line they pass through a finishing and parts assembly line, which forms unit No. 5. As in the first side member line, this unit consists of a single line carrying both right and left-hand members through all the operations. It is driven by a single motor of 200 hp. and is equipped with 38 trucks, on which each a left and right-hand bar are automatically loaded. These trucks move on a reciprocating conveyor stopping at 19 stations where the side bar sub-assemblies are completed, including pinning and riveting of the frame brackets. Since the operations on this line differ rather considerably for the various types of frames manufactured, a detailed description of its operations would not be strictly applicable to all types. The line has a capacity of 900

Above—Side bar finishing and parts assembly unit showing the automatic feeders on each side of line. The two large presses in the foreground are the forming presses of the side bar manufacturing line

bars, of which 450 are each right and left-hand members.

Unit No. 6 is the general assembly line where side and cross-members are assembled. Of course the operations of this unit are also controlled by automatic conveyors, which here also are of the reciprocating type. Side and cross-members sub-assemblies are automatically picked up by this unit, clamped together and passed first to the rivet-nailing machine and then through the riveters. These riveting machines are synchronized to operate automatically with the feed of the conveyor. First the riveting machines are drawn back out of place, the conveyor then moves the component parts of the frame into position, the riveting machines move up to the line from both sides, and the jaws of the riveters place themselves in position. An ingenious method of feeding rivets to the nailing machine is used. In the basement there are large containers from which the rivets are picked up automatically and fed into compressed air tubes to guns which discharge the rivets into the frame through the rivet-nailing machine when the frame is in proper position. There are three types of riveters, varying in the type of jaws used, with jaws adjustable in various positions, these three types being capable of taking care of any type or location or riveting required. Riveting pressure is about 20 tons, and the capacity of the line is 360 frames per hour.

Finished frame assemblies are then carried by a conveyor through a visual inspection, forming unit No. 7, and on to unit No. 8, which is the washing and painting machine. Here the frames are automatically loaded on to the conveyor, passing through a washing machine to remove all oil, grease and dirt accumulated during the manufacturing process. With the washing machine is combined a dryer, from which the frames are conveyed by gravity to the loading station of the painting machine. A high temperature baking enamel is used. This enamel flows at the rate of 750 gallons per minute, the excess being drained off and returned to the tank. From the painting unit (700 feet long) conveyors take the frames through a two-story oven where they are baked for a period of 60 minutes.

Frames are then ready for shipment. Due to fluctuating shipping conditions in the automotive industry, however, it was found necessary to design a finished frame storage unit. Here again material handling has been almost entirely automatized. The building itself is four stories high, and consists mainly of a wall built around a series of shelves. Under the roof there is a network of monorails on which a traveling crane can be directed into any battery of shelves. This crane has an automatic lowering device enabling the picking up of frames from any level in the building. When the crane has reached the correct level this fact is indicated by a light which flashes a signal in the operator's compartment.

Below—View of the automatic inspection machine with the rollers which roll the steel to remove curvature. This is the first step in the production system

Machining Department

In the automatic frame building there is also a large department for the machining of the castings and brackets which are a part of the frame assembly. This department has a capacity of over 2½ million castings per month.

The total time required from raw material to finished frame through this plant is one hour and 50 minutes, 90 per cent of which is represented by the time taken up in conveying materials from point to point.

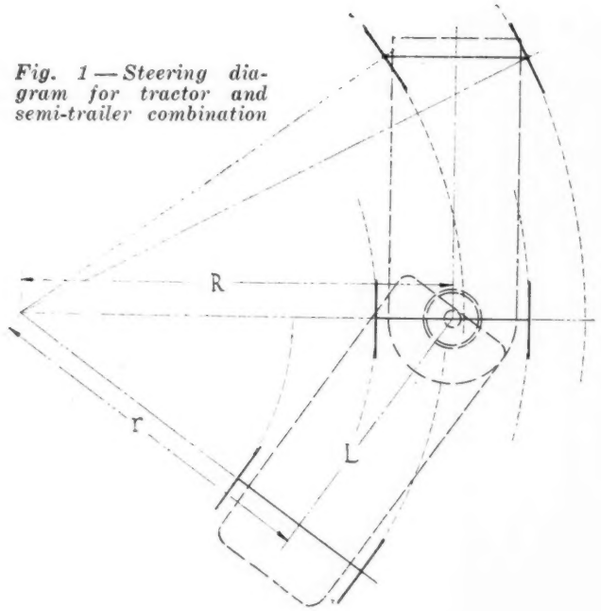


Fig. 1 — Steering diagram for tractor and semi-trailer combination

Rules *for* Finding of Tractors

Radii of tracks described by combinations in turning by graphical construc-

By P. M.

THE radii of the tracks described by the wheels of tractor and trailer combinations in turning corners can be readily found by graphical construction. The construction used for determining the least turning radius of a car, truck or tractor was dealt with in a recent article in these columns and is well known.

A semi-trailer usually connects with the tractor by means of a bolster and fifth wheel, the vertical axis of which passes through the center of the rear axle of the tractor. If the turning radius of the center of the tractor rear axle is R and the horizontal distance from the center of the fifth wheel to the supporting axle of the trailer L, then the turning radius of the center of the trailer axle is

$$r = \sqrt{R^2 - L^2}$$

From this the radii of the tracks described by the wheels of the semi-trailer can be readily found by merely adding and subtracting one-half the tread of the trailer.

The question now arises as to what effect it would have on the radii of the tracks described by the trailer wheels if the fifth wheel axis were moved either ahead of the tractor rear axle or to the rear of it. Wherever the fifth wheel may be located along the longitudinal center line of the tractor, the steering diagram for the semi-trailer is always a right angled triangle whose corner points are formed by the axis of the fifth wheel, the center of the semi-trailer rear axle and the turning point. The location of the turning point or turning axis is not changed by altering the position of the fifth wheel, as that depends upon the length of wheelbase and the maximum deflection of the inner steering wheel of the tractor only.

A point in the longitudinal axis of the tractor directly above its rear axle is evidently that point in this axis which is closest to the turning point. If we move the fifth wheel either ahead of the rear axle or back of it, the horizontal line connecting the fifth wheel axis to the turning point is lengthened. But in a right-angled triangle, if the hypothenuse is increased and one of the other two sides remains the same, the third side must be increased in length. The side remaining the same in this case is the length L from the axis of the fifth wheel to the center of the semi-trailer rear axle, and the side which must be increased is the distance from the turning point to the center of the trailer rear axle. Hence the turning radius of the center point of the trailer rear axle increases, and the radii of the tracks described by the wheels of the trailer are increased when the fifth wheel is moved away from over the center of the rear axle of the tractor, whether it is moved forward or backward. Of course, this case is of little practical importance because it is usually desired to carry the load of the semi-trailer directly over the tractor rear axle.

The geometry of four-wheel trailer steering is substantially the same as that of semi-trailer steering. Supposing that the minimum turning radius of the rear axle center of the truck or tractor is known, or has been calculated by the method heretofore explained, the first step evidently is to determine the turning radius of the pintle hook by which the trailer is connected to the tractor. This is usually secured to the rear cross-member of the truck frame and is located back of the truck rear axle a distance which we will designate A, in the longitudinal center line of the tractor. The turning radius of the pintle hook then is

$$R_1 = \sqrt{R^2 + A^2}$$

Now if the length of the drawbar is B, then the turning radius of the center of the trailer front axle is

$$R_2 = \sqrt{R_1^2 - B^2}$$

Since

$$R_2^2 = R_1^2 - B^2 \text{ and}$$

$$R_1^2 = R^2 + A^2$$

$$R^2 = R_1^2 - A^2 \text{ and}$$

$$R_2 = R \text{ when } B = A$$

Expressed in words, the front wheels of the trailer will track with the rear wheels of the tractor if the pintle hook is located back of the tractor rear axle a distance equal to the length of the drawbar, which latter is considered rigidly secured to the middle of the trailer front axle. Normally the pintle hook would hardly be placed so far back, because of the heavy side drag on the driving wheels of the tractor due to the draft of the trailer when turning a corner.

As regards the turning radii of the trailer rear

the Turning Radii *and* Trailers

wheels of tractor and trailer corners can be readily found tion. Methods described.

Heldt

wheels, they bear to the turning radii of the trailer front wheels the same relation as the turning radii of the wheels of a semi-trailer bear to the turning radii of the rear wheels of a tractor, and can be determined by the methods already explained.

When Wheels Follow Same Tracks

In some lines of work it is desirable that all of the wheels of a tractor-trailer train should follow the same tracks, at least nearly. This applies to industrial tractor-trailer trains which must make right-angled turns at the intersections of factory aisles, without fouling any obstructions at the inner corners. In such cases both tractors and trailers are generally made to steer by all four wheels.

As may be seen by referring to Fig. 3, when the front and rear wheels on the same side of a tractor are swung through the same angle in steering, the tracks of these two wheels coincide, or, in other words, the wheels track. Similarly, if the front and rear wheels of a trailer are swung through the same angle in steering, the trailer wheels also will track with each other. Now, it is plain that if the trailer wheels are swung around their pivots to give the same turning radius as that of the tractor, then the wheels of the trailer will track with those of the tractor, and this evidently is the condition which makes it possible to manoeuver such trains in the narrowest aisles.

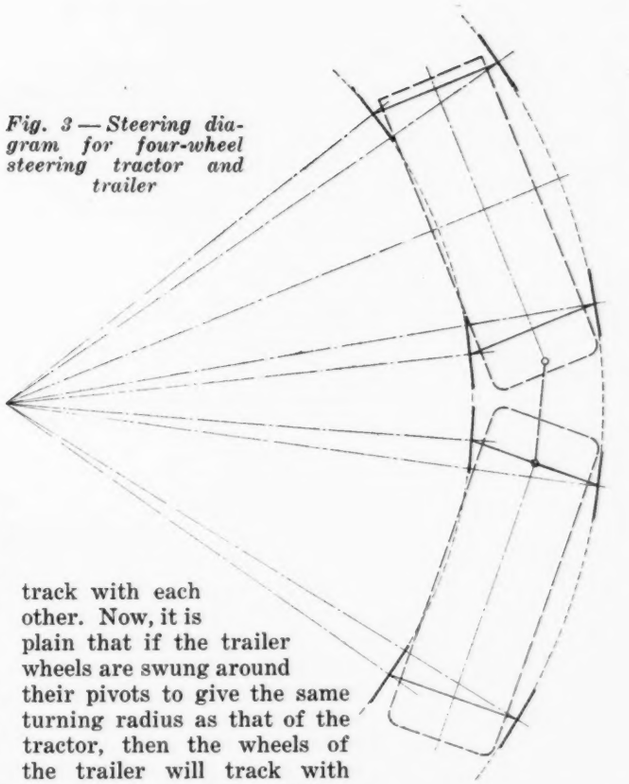


Fig. 3 — Steering diagram for four-wheel steering tractor and trailer

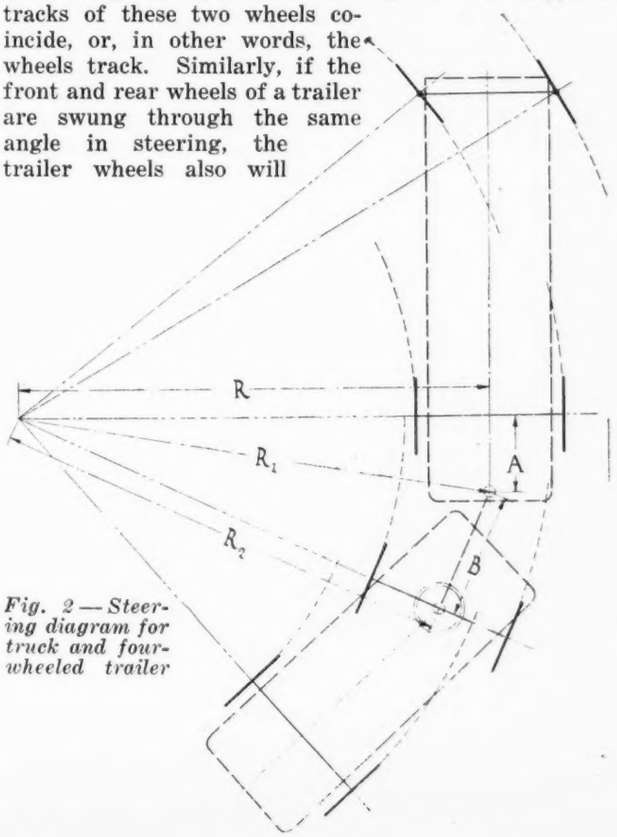


Fig. 2 — Steering diagram for truck and four-wheeled trailer

In order to steer a vehicle by both front and rear wheels so that these wheels will track, both sets of wheels may be mounted on swiveled knuckles and the linkages so interconnected that when the front wheels are swung around their fulcrums through certain angles, the rear wheels are swung around their pivots through the same angles in the opposite direction. This can be accomplished with comparatively simple mechanism. It is also necessary to have mechanism on the trailer which will swing around the wheels of the trailer through the same angles as those of the tractor if the wheelbases are the same, or through corresponding angles if they are not. This can be accomplished by means of a link between the drawbar and an arm on one of the steering knuckles. As soon as the wheels of the tractor are swung around by means of the steering mechanism, the drawbar assumes an inclined position relative to the front axle of the trailer, and this angular motion between drawbar and trailer front axle will serve to impart steering motion to the wheels of the trailer. The lengths of arms and the best angle of the knuckle arm must be carefully worked out, of course.

Turning in Factory Aisles

The question sometimes arises as to whether a truck or a train composed of a tractor and trailers can make the turn at the intersection of aisles in a factory. The factors involved in the problem are the maximum turning radius R, measured to the center of the outermost track described by the wheels of the truck or tractor; the minimum tuning radius r; the widths W and W_1 of the aisles and the clearance allowance a which must be made, this being equal to one-half the width of the tire if the vehicles must keep within the limits of the aisles at the floor level only, whereas if there are obstructions above the

floor level it must be made equal to the overhang of the hub caps or other projecting parts beyond the center planes of the wheels. If the body overhangs the rear axle considerably, its rear corner will be the furthest projecting point.

The distance from the turning axis to the outer

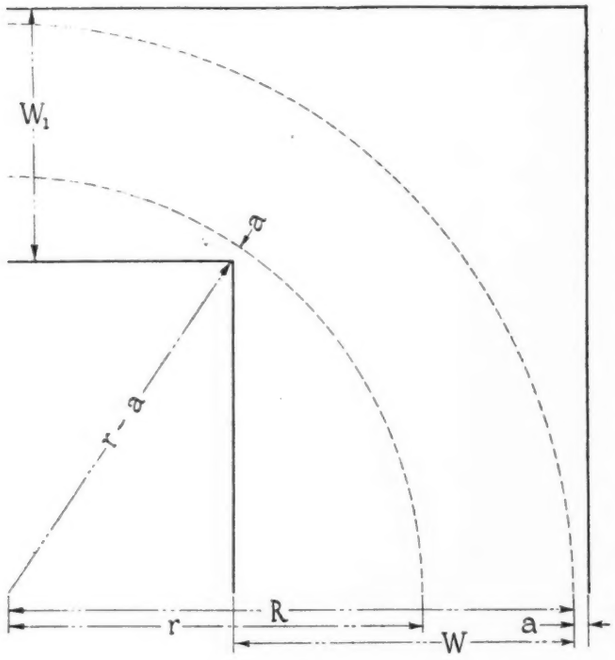


Fig. 4—Relation between track radii and width of intersecting aisles which can be negotiated by vehicle or train

edges of both aisles is evidently $R+a$, and the distance of the point of intersection of the inner edges of the two aisles from the turning point must not be greater than $r—a$, because otherwise the innermost wheel would hit the corner. Now, the distance from the turning point to the point of intersection of the inner edges of the aisles is the diagonal of a rectangle whose sides are equal to $(R+a-W)$ and $(R+a-W_1)$ and the vehicle or train can make the turn if this is less than $r-a$; that is when

$$\sqrt{(R+a-W)^2+(R+a-W_1)^2} < r-a$$

If both aisles are of the same width W, then the truck or train can make the turn when

$$1.41\,(R+a-W) < r-a$$

With the aid of the above rules and formulae practically any problem in turning radii can be worked out.

Thermal Expansion of Beryllium

A STUDY of the thermal expansion of beryllium, one of the lightest of metallic elements, and of aluminum-beryllium alloys, has been made at the Bureau of Standards, and the results are published in Scientific Paper No. 565 of the Bureau. The investigation was made by Peter Hidnert, associate physicist, and W. T. Sweeney, assistant scientific aid. Samples of beryllium and of the aluminum-beryllium alloys were furnished the Bureau by the Beryllium Corp. of America, Cleveland, Ohio.

One sample of cast beryllium and five samples of cast aluminum-beryllium alloys (4 to 33 per cent beryllium) were investigated. The following information regarding the casting of beryllium was furnished by the manufacturer:

"In melting and casting beryllium our practice has been first to prepare a flux composed of about 10 per cent barium fluoride and 90 per cent barium chloride. This flux, after fusion and cooling, is ground to a fine powder. The buttons of massive beryllium are placed in a graphite crucible and a small amount of this powdered flux sprinkled on the surface. The crucible is then covered with just the ordinary graphite cover and heated to about 1350 or 1400 deg. C. in a gas furnace. About 5 or 10 minutes before pouring it is advisable to remove the cover and rotate the crucible in order to bring all the particles of metal together in one fluid mass. It is then superheated for about 10 minutes longer and rapidly cast. We might add that in the melting of small amounts, such as 10 to 25 g, some losses are sustained, but in handling larger amounts we have been able to get practically 100 per cent recovery in this manner." The results of the investigation are summarized as follows:

The coefficient of expansion of beryllium increases rapidly with temperature. The coefficients or rates of expansion at — 110 and + 650 deg. C. are 5.0×10^{-6} and 20×10^{-6} per deg. C., respectively. For the temperature range from 20 to 100 deg. C. the average coefficient of expansion is 12.3×10^{-6} per deg. C. Beryllium expands considerably less than the other elements of subgroup IIB (magnesium, zinc, cadmium, and mercury).

The coefficients of expansion of the aluminum-beryllium alloys decrease with increase in the beryllium content. For example, an aluminum-beryllium alloy containing 30 per cent beryllium has coefficients of expansion approximately 20 per cent less than those of aluminum. The coefficients of the aluminum-beryllium alloys increase with temperature. On a second heating the coefficients of expansion are generally larger than the corresponding values obtained in the first heating. The maximum deviation between the coefficients on the first and second heating is 0.9×10^{-6}, and the average deviation is $\pm0.3\times10^{-6}$. The coefficients obtained in the first tests represent values for cast alloys, but the coefficients in the second tests are considered to represent results for heat-treated or annealed cast material. The relations between the coefficients of expansion and the chemical composition were compared with the equilibrium diagram obtained by Oesterheld, and were found to be in agreement with the theory for this type of diagram.

The following table gives a resume of average coefficients of expansion derived from the data on all samples for various temperature ranges between 20 and 500 deg. C. In most cases, each coefficient represents an average of the values obtained on two or more heatings.

TABLE—*Resume of average coefficients of expansion of beryllium and aluminum-beryllium alloys*

Material	Average coefficients of expansion per degree centigrade				
	20 to 100° C ×10⁻⁶	20 to 200° C. ×10⁻⁶	20 to 300° C. ×10⁻⁶	20 to 400° C. ×10⁻⁶	20 to 500° C. ×10⁻⁶
Beryllium (98.9 per cent)....	12.3	13.3	14.0	14.8	15.5
Alloy (4.2 per cent beryllium)	22.2	23.2	24.4	25.1	26.5
Alloy (10.1 per cent beryllium)	21.4	22.5	23.3	24.1	25.4
Alloy (18.6 per cent beryllium)	20.0	20.8	22.1	23.0	24.0
Alloy (27.5 per cent beryllium)	18.8	19.8	21.1	22.0	23.0
Alloy (32.7 per cent beryllium)	17.9	19.2	20.6	21.3	22.3

Just Among Ourselves

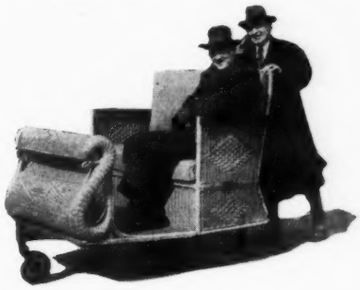
Open Weather Opening Up Sales

THE unusually open weather so far experienced this year seems to be bringing satisfactory sales in most areas as the first quarter wears on. January in many places was disappointing. Sales figures for about 10 large city areas, for example, showed a decrease for January, 1928, as compared to January, 1927, despite the fact that factory production during the same period was larger this year than last. With the public gradually sensing price stabilization, however, retail markets seemed to open up more rapidly last month, while early March reports continue to be favorable in most territories. As has been the case for the last few years, of course, prosperity is not perching with equal weight on all makes, but some of those who failed to do well in the early part of last year are making better strides at present. Thus far it can be said that, while 1928 did not open as well as had been expected, retail sales seem to be swinging into line with optimistic predictions fairly well at the present time.

* * *

Grant Wins a Bet and a Ride

B. G. KOETHER heads up the department on General Motors Advisory staff which, as a part of its work, helps prognosticate future sales. Recently, according to the caption which came with the accompanying photograph from the Atlantic Foto Service in Atlantic City, he prognosticated what Chevrolet sales would be over a given period. R. H. Grant, Chevrolet's general sales manager, bet that Mr. Koether's estimate was too low. The results showed both gentlemen to have been too conservative in their predictions. The consequence was the payment of the bet by a personally pushed roller chair ride, the start of which is herewith illustrated, Mr. Koether indulging in the activity made famous by the Delaware-Lackawan'.



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Management Responsible for Industrial Relations

ONE of the most successful manufacturing executives in the automotive industry expressed the idea recently that final responsibility for satisfactory working out of industrial relationships must rest with management and those who control and own manufacturing plants. His theory is that management, by virtue of its financial and economic dominance, is in a position to do positive things; to work out constructive plans, while the individual worker or workers as a group are more or less necessarily confined to resisting abuses and protecting themselves from real or fancied injuries. The active responsibility of management in this respect always has seemed to us to be sound in theory. Certainly the genesis of the organized labor movement was the need for combined economic power to resist specific conditions unfavorable to the individual worker. Removal of those conditions voluntarily by management before pressure, probably would have been the only means of preventing the type of organization which has grown up.

* * *

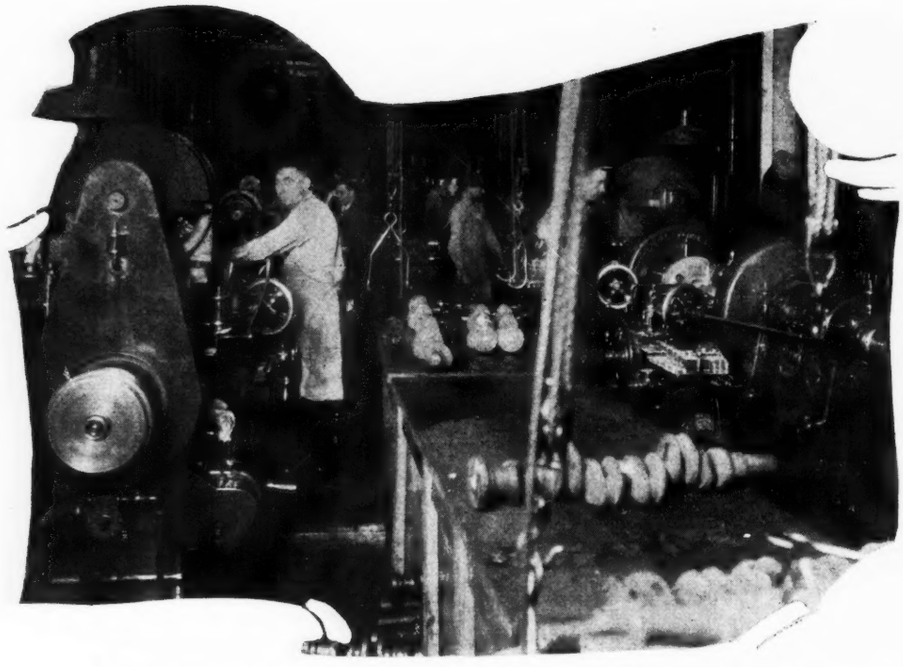
Considering the Worker as an Individual

WHERE management acts voluntarily, as has usually been the case in the automotive field, the possibility of acting constructively and at the same time in a way satisfactory to the workers is increased to a marked degree. There have been many cases in which a labor group was entirely sound in its analysis and estimate of an abuse and entirely unsound in its idea of how that abuse might properly be alleviated or eliminated. It is true that fundamentally the interests of the employer and the worker are one, but only careful and continuous attention to the details as well as the principles of industrial management can provide the basis for reasonably frictionless operation. After all, sound handling of industrial relations in the industry is a matter of proper coordination and treatment of a multitude of details of relationships rather than one of fine words and public oratory. In consideration of the individual worker as an individual lies the path toward permanent adjustments.

* * *

1928 a Quiet Legislative Year

THIS bids fair to be a relatively quiet year so far as state legislation on automotive topics is concerned. Only a few state legislatures will be convened in 1928, last year having been the big year in this regard. —N.G.S.



General view of machine line-up of Continental six-cylinder engine line

Output Easily *Varied* by Special *Machine* Arrangement

Continental method gives flexibility by making it possible to cut out certain machines when necessary without interfering with the production line

By K. W. Stillman

AN interesting feature in the production line-up adopted by Continental Motors Corp., for making a six-cylinder engine which is turned out in fairly large quantities, is the machine arrangement employed whereby output can be varied within rather large limits without affecting to any considerable degree the efficiency of the work.

As shown in an accompanying illustration, the primary machine line-up consists of two parallel rows of machine tools separated by a sheet-steel-topped table extending the length of the aisle which serves as both a repository for pieces in process and also as a sort of conveyor along which crankshafts are slid from one operation to the next.

At frequent intervals passageways from one machine row to the other are provided but with these exceptions the steel-topped table is continuous. Machine tools are generally arranged in pairs on either side of the table. If two machines are required to meet maximum output on one operation, they will be placed opposite each other, one in each row. When more machines are required they are arranged in the same general manner.

When the production program calls for less than maximum output it becomes a simple matter to cut one or more duplicate machines out without leaving any wide gaps in the line or making it any more difficult to pass the work from one operation to the next.

As may be seen in the illustration, each machine tool is served by special tongs suspended from block and tackles—air hoists are employed at some stations—which greatly reduce loading and unloading time and eliminate the fatigue of manual handling the heavy crankshafts.

The first operation performed in this line is to turn the center bearing to provide a steady rest for subsequent operations. This is done on LeBlond 21-in. lathes. Following this, the front, rear and center main bearings are cheeked and turned in 34-in. Wickes semi-automatic crankshaft lathes.

On the same type of machine of various sizes the next three operations are performed. They consist of straddle facing and turning the outside diameter of the flange and forming the oil thrower and bolt circle; cheeking and turning the four intermediate bearings, and turning the gear fir and facing the front main bearing.

A Newton drum mill is next employed to mill the crankshaft to length and it is recentered in a Rockford

centering machine. A straightening operation by means of a 20-ton General press follows.

The main center bearing is rough ground in a Norton 10 by 50 in. grinder and the four intermediate, the front and rear main bearings are all finish turned in a single operation in a Melling lathe made by Walcott Machine Co.

Three more Wickes 34-in. semi-automatic crankshaft lathes are next brought into action to cheek and turn Nos. 1 and 6, 2 and 5 and 3 and 4 pins after which the chankshaft is again straightened.

Six flange holes are drilled in a Colburn No. 2 drill and the contour of the throws are then turned in a Walcott contour lathe.

After a burring operation all cheeks are chamfered in four operations. The first, in a 34-in. Wickes lathe, chamfers the main bearing cheeks while the other three are performed in 31-in. Wickes lathes and cheeks of two pins are chamfered in each.

Another straightening operation takes place next, if necessary, a Greenard No. 5 arbor press being employed at this station. Then all pin bearings are rough ground in a Landis 16 by 48 in. pin grinder.

In three 14-in. Leland-Gifford drills oil holes are drilled in Nos. 1 and 6, 2 and 5, and 3 and 4 pins and the holes are countersunk with a tool operated by an air motor. Another 20-ton General press is used to straighten the crankshaft at this point.

Finish grinding operations follow next. The center bearing is ground in a Norton 16 by 50 in. grinder; the four intermediate bearings in a Norton 10 by 50 in. grinder; the front bearing and gear fit in a 14 by 50 in. Norton grinder; the rear bearing in a similar machine, and outside diameter of the flange is finish ground in a 16 by 50 in. Norton.

The next operation is to ream the flange holes, which is done in a Colburn No. 22 drill, after which all pin bearings are finish ground in a Landis hydraulic grinder.

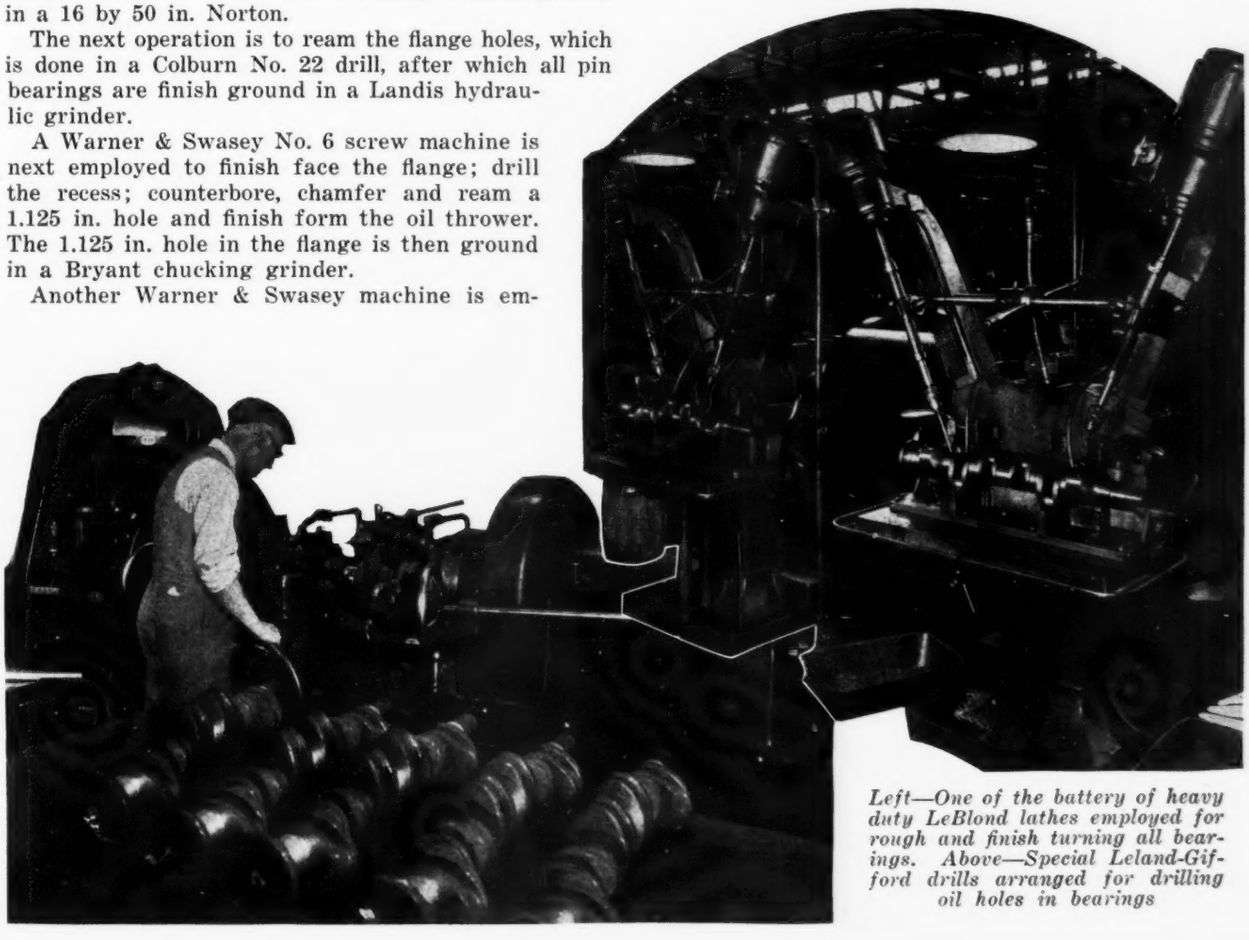
A Warner & Swasey No. 6 screw machine is next employed to finish face the flange; drill the recess; counterbore, chamfer and ream a 1.125 in. hole and finish form the oil thrower. The 1.125 in. hole in the flange is then ground in a Bryant chucking grinder.

Another Warner & Swasey machine is employed to drill, bore, counterbore and tap the starter jaw hole and face to length. A No. 21 keyway is then milled in a Whitney No. 6 hand milling machine and a No. 127 keyway milled in a Kent-Owens No. 2 hand mill.

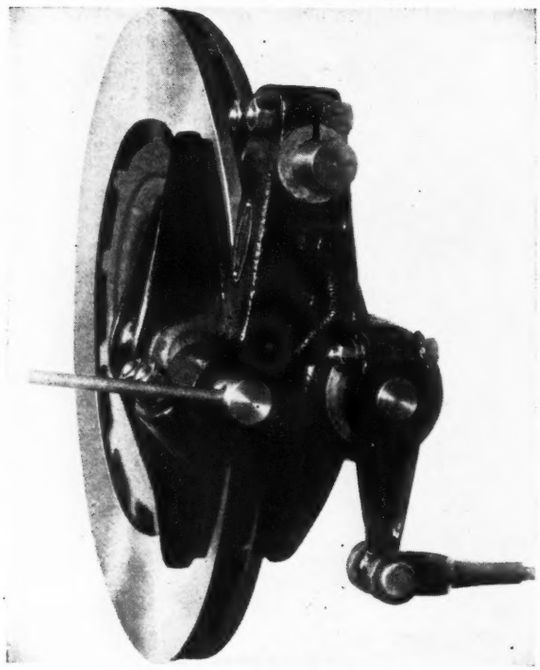
The six flange holes are countersunk in another Colburn No. 22 drill, and the corners are broken and burred. All bearings are next lapped in a Blount speed lathe, the crankshaft is inspected, the back of the flange ground in a Norton 10 by 50 in. grinder and a final straightening operation is given.

Following this the crankshaft is balanced and is then ready for the final inspection.

THE Bureau of Standards in making tests of fuel for anti-knock value makes use of a high-compression single-cylinder engine and adjusts the throttle to prevent excessive detonation with each fuel. The relative power which different fuels develop under these conditions is taken as a measure of their anti-knock value. Fifteen gasoline samples, submitted by refiners as typical of last winter's production, were found to range from 11 per cent worse to 30 per cent better than the U. S. motor gasoline then being furnished the Government departments under contract. Six composite gasoline samples, representing the average non-premium gasoline sold at filling stations in various sections of the country, were also tested. The west coast sample showed the least tendency to knock, the Texas sample came next and was followed by two east coast samples. The sample from the Chicago district showed the greatest tendency to knock, but calling this 100 the Texas sample was rated 105 and the California sample 118.4.



Left—One of the battery of heavy duty LeBlond lathes employed for rough and finish turning all bearings. Above—Special Leland-Gifford drills arranged for drilling oil holes in bearings



Propeller shaft disk brake

Driveshaft Disk *Brake* Introduced *for* Passenger Cars

Design similar to that furnished by American Cable Co. for truck service. Compactness and easy cooling are among advantages.

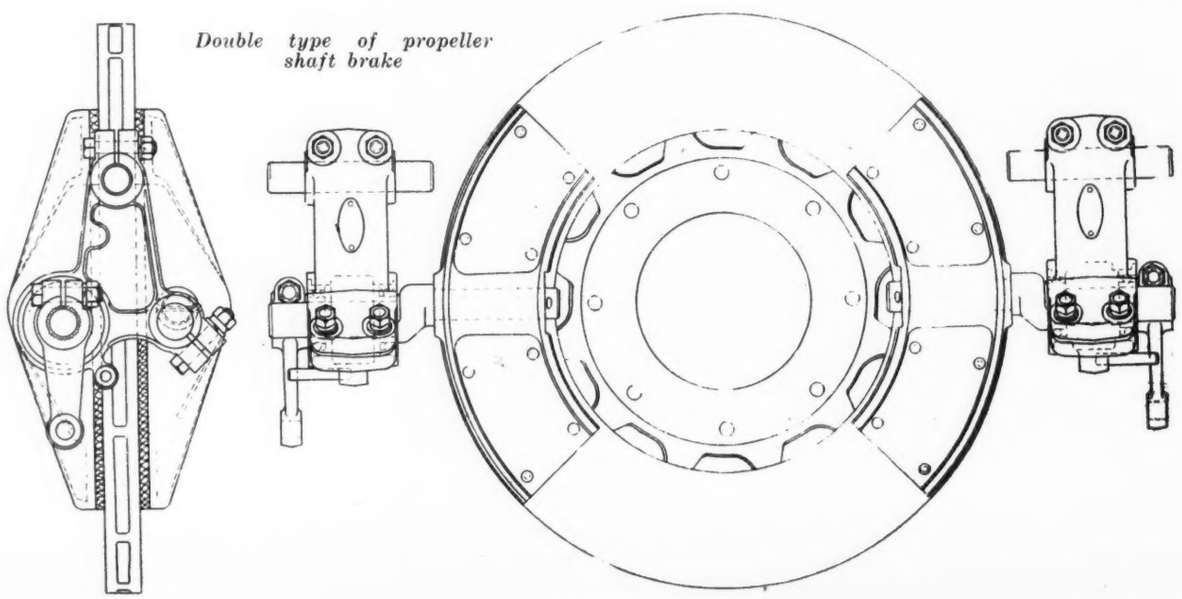
THE American Cable Co. of Bridgeport, Conn., has been manufacturing for some time a disk brake for mounting on the universal joint back of the transmission, which brake is now standard equipment on a considerable number of trucks. Recently a passenger car size of the same type has been brought out. Several illustrations of these brakes are shown herewith.

The disk of the passenger car type is made entirely of steel stampings ¼ in. thick. It comprises a spider and hub in one stamping and two rubbing disk stampings, the three being fastened together with rivets and so formed that there is air circulation between the disks. The assembly is secured between the universal joint and its flange. The parts of the propeller shaft pilot into the bore of the brake disk, so that concentricity of all parts is assured.

Another type of disk, which is made in 12, 14, 15 and 16 in. sizes, is made of two drop forgings with radial ribs on their adjoining sides, these ribs acting as spacers and insuring ventilation of the disk. In this design the hub member is formed with lugs on its circumference while the annular disks have corresponding lugs on their inner edge, the parts being assembled by bolts.

When the brake is applied the disk is gripped by two brake shoes made of malleable iron and lined with fabric friction material. Each of the shoes is mounted on a crank of small throw, the two cranks being carried in the lower end of a link which is pivoted at its upper end on a bracket secured to a cross member of the frame or to the crankcase. One of the cranks is rigidly clamped in the link while the other is mounted in two ball bearings therein and has a lever secured to its end projecting from the link. The crank which is clamped in the link serves for adjust-

Double type of propeller shaft brake



ing purposes. In one design it is held by the friction due to the pressure exerted by two clamping bolts, while in another the projecting end of the crank is formed with a flat on it, and a washer with a hole through it corresponding to the section of the shaft is passed over the shaft. This washer has radial serrations on its face which engage with similar serrations on the end of the hub on the link. When it is desired to adjust the brake, the clamping screws are loosened and the adjusting crank is turned until—with the pedal not far from the innermost position—the brake shoes contact with the disk. The clamp screws are then tightened again. With this means of adjustment it is unnecessary to adjust the linkage, and the position of the operating lever when the brake is applied can be kept constant throughout the life of the linings.

Lever Extends Upward

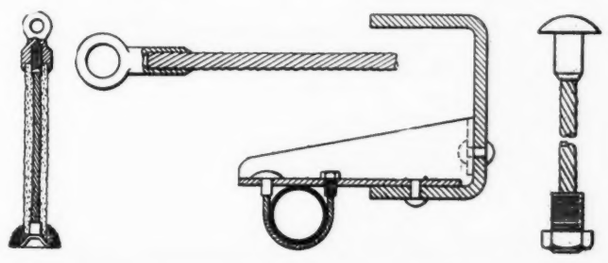
The lever on the crank which applies the shoes to the disk usually extends upward. This has the advantage that it reduces the end thrust on the brake disk and on the shaft on which the latter is mounted, for if the hub at the free end of this lever were in line with the fulcrum of the link there would be no end thrust.

Among the advantages claimed for the disk brake are that it is of particularly compact design and that it cools well, which makes it possible to descend long hills on the brake without overheating and burning of the brake lining. The brake can be relined very easily, all that is necessary being to slip out the link pin, drop down the link, remove the cotter pins and slip off the shoes. In an emergency the operation of relining can be performed on the road. It is not necessary that the disk should run true, as the link suspension will take care of any running out.

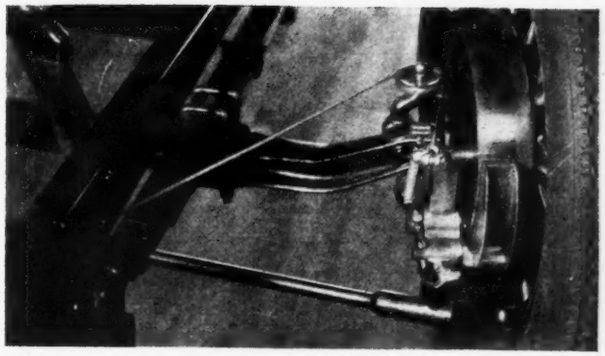
If necessary to give sufficient brake capacity, two pairs of shoes can be fitted to apply to the same disk.

The American Cable Co. also manufactures Tru-Lay cable for brake connection. This cable is made up either of single wires or of strands of which each contains a considerable number of wires. The peculiarity of the Tru-Lay cable consists in the fact that the single wires or strands are individually formed to shape before the cable is laid, hence they retain their position when the cable is cut. The cable ends or fittings are joined to the cable by what is called a Tru-Loc. An axial hole is drilled into or through the hub of the fitting, of a diameter equal to the maximum diameter of the cable. The end of the cable is then inserted into this hole and the material of the hub is swaged down upon the cable by a hydraulic swaging process which causes the metal of the fitting to flow into the interstices between the individual wires of the cable, making a very secure joint.

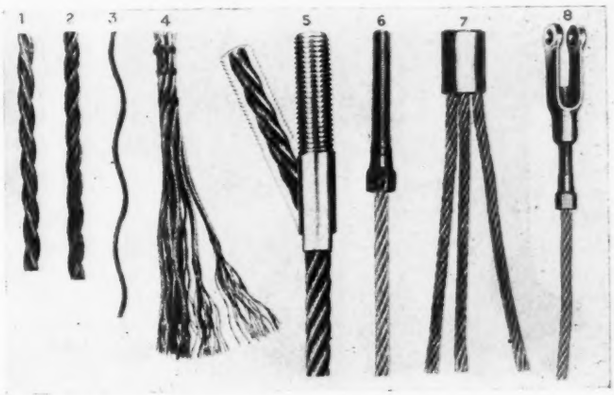
The effectiveness of the joint was recently demonstrated in a series of tests by Professor Huntly at the Armour Institute of Technology at Chicago. In these tests a large number of cables of various sizes were loaded to the actual breaking point. In each case the complete breaking strength of the cable was secured, but in no case was there any slippage of the cable in the fitting.



A group showing applications of Tru-Lay cable to body fittings and for mounting chassis parts



How one user of "Tru-Lay" cable and "Tru-Loc" fittings has designed his front brake linkage



1 and 2—Lengths of two different types of preformed cable made by the American Cable Co., each with every other strand removed. 3—Strand of preformed wire showing how it is shaped to the exact helical position it will occupy in the cable before assembly into rope. 4—How ordinary wire rope "explodes" when cut. 5—"Tru-Loc" fitting cut open to show how the metal grips the strands and wires in the cable. 7—Example of multiple rope fitting. 6 and 8—Threaded hexagon fitting which permits application of shackles, as shown, or turnbuckles, rods, etc.

The success of the new cable and fitting is attested by its adoption for various parts of the brake mechanism by Cadillac, La Salle, Dodge Brothers, Packard, Stearns-Knight and Studebaker among passenger car manufacturers, and by Walker, A. C. F., American-LaFrance, Brockway, Gramm, National, National-Howard, Sanford, Selden, Standard and Mack in the commercial vehicle field.

Some of these makers are using Tru-Lay cable and Tru-Loc fittings for the whole of the brake linkage; others use it for front brakes only and still others use the system in combination with other mechanical developments.

A recent development of the Tru-Lay cable is known as a flexible bolt. The central portion of this bolt consists of a length of cable to which the head end of an ordinary bolt is swaged at one end and the threaded end at the other. So-called U bolts are also made, consisting of lengths of cable to which threaded shanks are swaged at both ends.

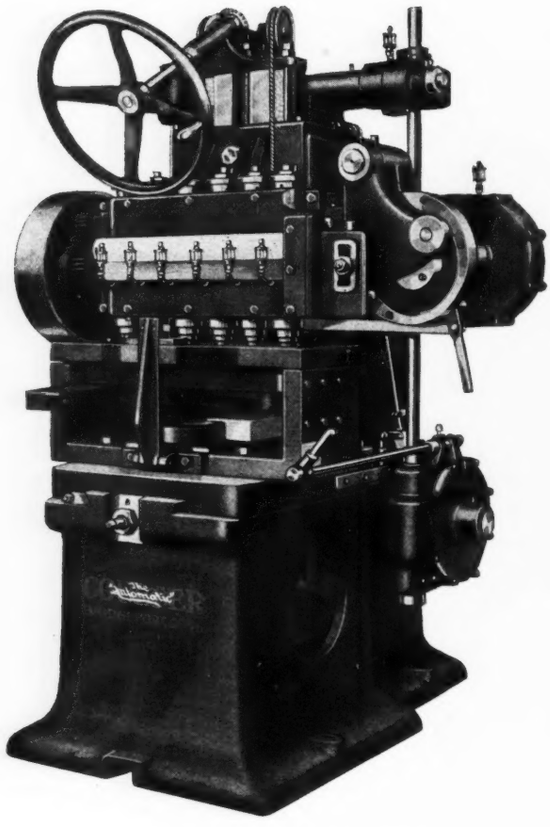


Fig. 1—Coulter automatic multi-spindle profiling machine

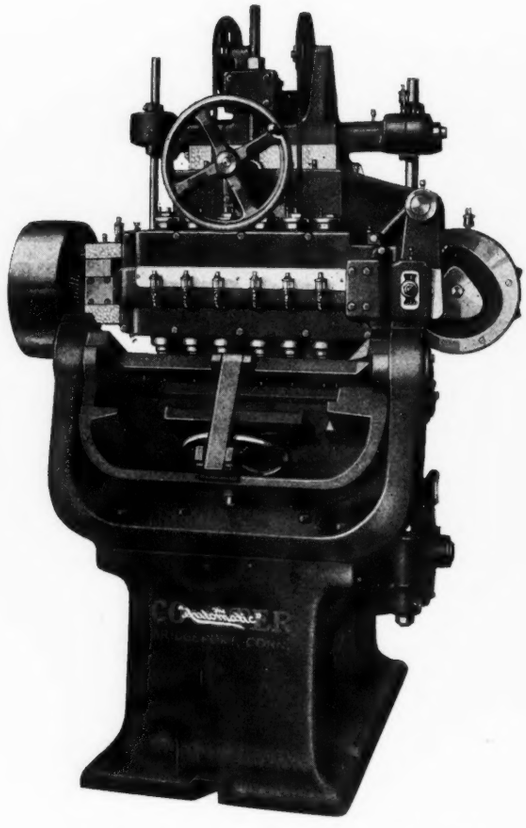


Fig. 2—Same machine equipped with swinging fixture

Coulter Profiling Machine *is* Used *on* Combustion Chambers

Built in both horizontal and vertical types and in two sizes. Finishing operation performed by means of milling cutters cutting on their sides and on their lower ends.

COMBUSTION chambers of L-head engines can be finished on the Coulter automatic multi-spindle profiling machine manufactured by the Automatic Machine Co. of Bridgeport, Conn. From the standpoint of the finishing operation, such cylinder heads may be divided into two classes. In one of these the bottom surface of the depression in the cylinder head which forms the compression space is a plane surface, while in the other it is curved. Both types of head can be finished on the Coulter machine.

While the machine is built in both horizontal and vertical types, the vertical type is generally preferred on account of the economy in floor space which it assures. Two sizes are built, the smaller machine for a smaller number of spindles and lighter cuts, and the heavier machine for up to eight spindles.

Drive is by an electric motor mounted on a bracket secured to the column of the machine on the rear side. A motor of from 10 to 15 hp. is required, according to the number of spindles and the weight of the cuts. From this motor the drive is by a belt of about 4½ in. width to a pulley which turns freely on the shaft of a long helical gear extending the length of the head, from which the spindles are driven. The helical gear is driven from the pulley through a gear reduction composed of four spur gears located close together and covered by the rim of the pulley. The spindle head with cross rail can be adjusted for height by means of a handwheel convenient to the operator when standing in front of the machine. These parts are counterbalanced by means of a balance weight at the rear of the machine, connected to the cross rail by a pair of steel cables passing over pulleys. The hand wheel is secured to an

inclined shaft that connects by bevel gears to the vertical screw which determines the adjustment of the head.

The finishing operation is performed by means of milling cutters cutting on their sides and their lower ends. In order to obtain the exact outline of the combustion chamber desired, the cutter head is moved on the cross rail, and the table, to which the work fixture is secured, is moved simultaneously at right angles thereto, that is, toward and away from the column. These two motions are not regular or uniform but are obtained through the intermediary of irregular cams laid out to give the particular profile desired. One of the cams, that which moves the spindle head, is plainly visible in the front view of the machine, while the other is located inside the column. The drive for both cams is taken off the long helical gear in the head at its left end (looked at from the front). At this point there is a vertical shaft which connects to a horizontal shaft near the top of the column by helical gears, and this in turn connects to another vertical shaft at the right side of the machine by another pair of helical gears. From this vertical shaft the two cams are driven by worms and worm wheels.

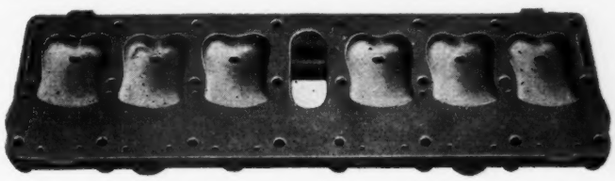


Fig. 3—Six-cylinder head finished on Coulter machine

The vertical shaft carrying the worms, and the housings for the worm drives can be seen at the right side of the machine in Fig. 1.

On the horizontal shaft of the feed line there is a clutch which is automatically stripped when the cycle is completed. The spindles are kept running continuously, but the feed motion is stopped when the machining operation is completed. When the work has been replaced the feed is started again by means of the lever at the front of the machine to the right.

The drive from the cams to the spindle head and the table respectively is through a swinging arm carrying a roller engaging into the cam groove of the cam and having a pin and slot connection with the part moved. The connection to the spindle head is shown in the front view of the machine, while the connection to the table is of a similar design.

The cylinder heads are held in fixtures which must necessarily be specially designed for each job. These fixtures may be either hand-operated or operated by compressed air. After the cycle is completed and the feed motion is stopped by the tripping clutch, the spindles continue to revolve and thus clear themselves. The duties of the operator are limited to inserting new work and removing the finished piece.

Compensation for Wear

An adjustment is provided which makes it possible to compensate for wear of cutter diameters, while another adjustment on the table feed mechanism aids in setting the fixture correctly and rapidly. The table has adjustable taper gibs. An independent vertical adjustment is provided for the position of the cutter on each spindle, and the spindle bearings can be adjusted for wear.

The spindles are mounted in bronze taper thrust bearings at the lower, and in straight bronze bearings at the upper end, the helical drive gear being located in between these bearings. On the larger machine any number of spindles up to eight can be provided, and the spacing of the spindles can be arranged to suit requirements. Should it become desirable to adapt the machine to work on a cylinder head of different design, this can be done by replacing the spindle head, the same spindles being used.

In cases where the bottom surface of the depression in the cylinder head forming the compression chamber is not a plane but a curved surface, it is necessary to mount the fixture on trunnions and connect it to the swinging arm operated from the feed cam. The machine equipped with swinging fixture is illustrated in Fig. 2 and a cylinder head finished in it in Fig. 3.

Different designs of cylinder head lend themselves more or less readily to finishing in one of these machines. In some cylinder heads all of the combustion chambers are exactly alike in contour, as in the case of the one shown in Fig. 3, while in others the compression chambers to one side of the center are different in form from those at the other side; in other words, there are rights and lefts. In this case only one-half of the compression chambers can be finished at one setting, as all of the finished surfaces formed will be alike. There is still another design of cylinder head in which only pairs of compression chambers located symmetrically on opposite sides of the center, are alike in form and can be machined at one time, so that the head must be passed through the machine a number of times equal to half the number of compression chambers in it. It is evidently of advantage to so design the cylinder head that all compression chambers are exactly alike in form.

The Coulter multi-spindle automatic profiling machine can be used also for finishing other automotive parts. In some cases the finished surface surrounding the opening of the valve chamber cannot be finished by surface milling because of interference of certain parts, such as the flywheel housing. The Coulter machine lends itself well to this operation. It is also being used for milling interior surfaces of steering gear housings, for milling the flanges of exhaust manifolds and inaccessible surfaces in bell housings.

In finishing compression chambers, the time of the cycle is generally between 3 and 5 minutes. Cutting speeds of about 80 ft. p.m. are provided for. The amount of stock removed varies from 1/16 to ⅛ in., and the machine has a range of feed of 4 in. in both directions.

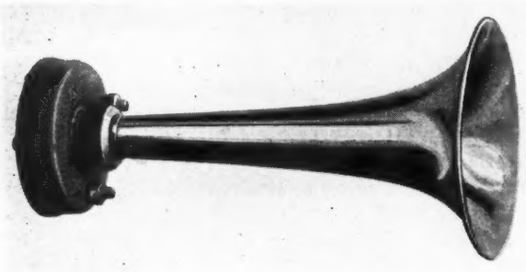
ACCORDING to an announcement in the French *Moniteur Officiel*, touring cars belonging to members of the American Automobile Association may be imported into France temporarily hereafter under regulatory conditions, with triptyques furnished by the Touring Club of France to the American Association concerned. The triptyques have a life of 12 months from the date of their delivery.

ACCORDING to the decree of the Portuguese Government, published Jan. 20, the importation of passenger cars of both the open and closed types up to 3300 lb. in weight, with a tolerance of 5 per cent on the weight is permitted, the provisions of the prohibitory order issued Sept. 30, 1924, being modified to that end.

New Developments— Automotive

Westinghouse Air Horn

WESTINGHOUSE AIR BRAKE CO., Wilmerding, Pa., has recently developed a pneumatic horn, a new warning signal device with a distinct, harmonious tone. The diaphragm, or vibrating unit, is inclosed in a cast base and is a phosphor bronze disk balanced with a small weight. The bell of the horn is highly burnished,



Westinghouse pneumatic horn

heavy gage instrument brass. It uses very little air and operates successfully over a wide range of pressures. The horn is available in various types and sizes to obtain different tonal qualities and in combinations for obtaining chime effects when desired.

Thor Grinders and Sanders

THE Independent Pneumatic Tool Co., Chicago, has developed a new line of Thor rotary air grinders and sanders, the features of which include balanced, vibrationless motors, governor, lubricator and muffler.

The motor has four Bakelite blades, balanced, which are unaffected by oil, water or heat and are very light. It is mounted on a rigid shaft in ball bearings. The spindle also runs in ball bearings. The adjustable governor is fully inclosed and keeps the free speed and air consumption low.

The automatic oiler carries enough oil to lubricate all moving parts for eight hours' operation. The baffle plate muffler, incorporated in a box-like lug on the spindle support, makes a quiet running motor.

The Thor No. 271 grinder weighs 15½ lb. and is 21¼ in. long. It has a straight handle throttle, speed of 4000 r.p.m., air consumption at no load of 20 cu. ft. at 90 lb., and carries a 6-in. emery wheel with 1½ in. face.

Model No. 272 is slightly larger, has a grip handle throttle and carries an 8 by 1½ in. wheel. Thor No. 271R sander has a right angle housing and carries any flexible disk up to and including 9 in. diameter.

Silent Steel Gears

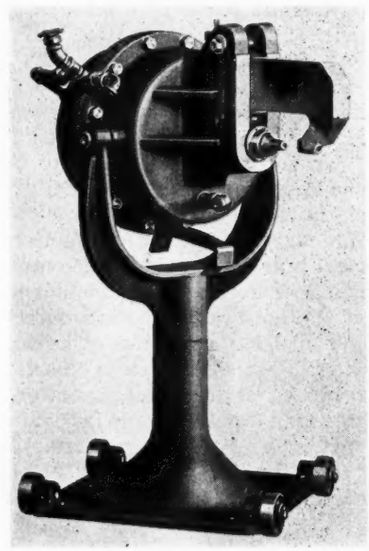
IN the past most attempts to render metallic gears quiet in operation have been directed toward improving the tooth form, instances of such endeavor being the use of helical teeth, teeth with a long addendum, ground teeth, etc. A metal gear which is rendered quiet in operation by building up the blank of very thin laminations is manufactured by the Flexible Engineering Corp., New York. The gears are known as Double D all-metal silent gears and are built up of laminations 0.005 in. thick. End plates of heavier stock are used and the whole is riveted together under pressure. The individual laminations are covered with graphite and the gears are self-lubricating. Double D silent pinions can be run in mesh with gears of the same construction or with gears of any of the materials that are usually run together with silent pinions.

Push-Type Riveter

THE new pneumatic "push type" chassis frame riveter developed by Hanna Engineering Works, Chicago, is designed to drive the horizontal rivets which secure the chassis frame members to the web of the side bar as well as the rivets which secure step hanger brackets to the chassis frame.

The inner or stationary nose is C-shaped to hook over the flange of the side bar, which is facilitated by the provision for tilting the rivet driving mechanism above the horizontal axis of the dies.

The mechanism may also be rotated upon a vertical axis which, with the cross travel provided, permits riveting on both sides of the chassis frame as it passes through the riveting line.



Hanna push-type pneumatic chassis frame riveter

The new riveter has a reach of 3 in., 7 in. gap, 2½ in. die stroke and is available in 15 and 20 tons capacity for driving 5/16 in. and ⅜ in. rivets cold.

Stronach Wire Nail

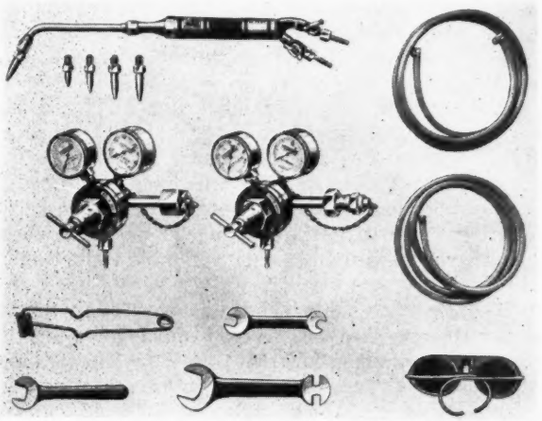
STRONACH NAIL CO., Union Bank Bldg., Pittsburgh, Pa., manufactures a wire nail which, instead of a sharp point, has what amounts to a blunt, triangular end. The edges of the triangular surface at the entering end are quite sharp, however, and are said to cut the fibers of the wood as the nail is being driven in, hence there is less wedging action and no splitting of the wood. The wedging action is not entirely eliminated, the body of the nail having a greater cross-sectional area than the triangular surface. Thus the fibers of the wood surrounding the nail will be

Parts, Accessories and Production Tools

compressed, which assures the necessary holding power. It is also claimed for this nail that it does not follow cross grain in the wood but always drives straight.

Presto-Weld Welding Outfits

THE Oxweld Acetylene Co., New York, has placed on the market three Presto-Weld welding outfits designed to meet the needs of small shops requiring low priced outfits. Two of the new outfits are intended for use in garages and repair shops while the third,



Presto-Weld welding outfit for light work

designated as Type W-102-B is recommended for auto body and fender work and for welding light and medium castings. This outfit contains five welding tips, two small, two-gage regulators and other items shown in the accompanying illustration.

De Lavaud Transmission Tests

TESTS carried out at the laboratory of the Arts et Metiers, Paris, show a mechanical efficiency for the Sansaud de Lavaud automatic transmission varying from 80.1 to 89.3 per cent. Twenty-nine distinct trials were made under the control of Government engineers.

The maximum efficiency of 89.3 per cent was obtained when transmitting 33.8 hp. and reducing the speed from 1493 to 270 r.p.m., while the minimum, observed 80.1 per cent., corresponded to the transmission of 20.6 hp. with a reduction from 1517 to 207 r.p.m.

Arc Welded Axles

A RATHER new application of electric arc welding in automobile construction is found in the Oldsmobile rear axle housing and in both the front and rear axles of Franklins.

Oldsmobile rear axle housings are being made of eight pieces of metal arc-welded together and the spring clips and bearing retainers are welded on.

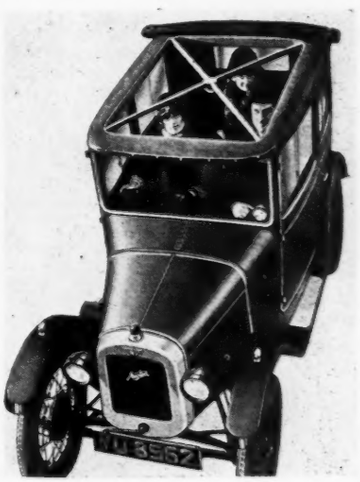
The Franklin axles are made of heat-treated steel tubes and these tubes are now being arc-welded to the wheel forgings instead of being riveted as was the former method.

Top—Oldsmobile rear axle housing made of eight pieces arc-welded together. Center—Detail view of Oldsmobile rear axle housing, showing method of attaching spring clip and bearing retainer. Bottom—Front axle assembly of Franklin, showing arc-welded connection between axle tube and wheel forgings

Stable Arc welders, made by the Lincoln Electric Co., Cleveland, are being used in both instances.

"Sunshine Sedan"

A NEW rendering of the "sunshine" sedan idea, which is becoming increasingly popular in England, has been put forward by F. Gordon England, the London body-builder, whose predictions as to the development of body construction and mounting were detailed in a paper published in *Automotive Industries* of Nov. 19 last, viz.: a more or less rigid body with a flexible three-point mounting.



Gordon England "Sunshine" sedan with flexible roof rolled back

The latter scheme is embodied in the new Gordon England sunshine sedan, which is illustrated herewith. As seen, fitted to an Austin Seven chassis, for which it has been standardized, the roof consists of a side framing braced by diagonally crossed struts; the covering is of leather fabric (or leather) fixed at the rear end and normally secured at the sides and front by a series of press-

buttons. When desired, the roof covering can be rolled back as shown and secured by two straps, affording the occupants a wider range of view and less of the "boxed-in" sensation.

With pneumatic upholstery, unsplinterable glass, extra lamps and other special accessories, the price of the car is £170; this is the same price as the fixed roof Gordon England sedan, but £20 more than the closed Seven supplied by the Austin Motor Co.

Schacht 2½-Ton Truck

A NEW 2½-ton, six-cylinder truck has been placed on the market by the LeBlond-Schacht Truck Co., Cincinnati. Designed for heavy-duty service, this unit, designated as the Model T, has a governed speed of 35 m.p.h. The total weight of the truck, completely equipped with cab, hoist, 3-yd. body and 34 by 7 in. pneumatic tires, dual rears, is 8400 lb. Six optional wheelbases are provided, 126 in. for tractor, 140, 152, 156, 180 and 193 in.

The powerplant is a 3¾ by 4½ in. six-cylinder Waukesha, which employs a Ricardo head, seven-bearing crankshaft, force feed lubrication to main, connecting rod, camshaft and piston pin bearings, gear water pump and Swan manifold. Battery ignition with a Leece-Neville distributor is standard, as well as electric lights with same make of generator and starter. The carburetor is a 1¼-in. Zenith Model 105-DC. Capacity of tank is 20 gal.

Mounted in unit with the engine is a multiple-disk, 14-plate clutch and a four-speed transmission. Final drive is through a full floating, double reduction type rear axle. Rear axle ratios of 8 2/3 and 9.42 are available for commercial and dump service respectively. Drive is taken through ball jointed radius rods.

Both brakes are located on the rear wheels but operate in separate drums. The diameter and width of the service brake is 20 by 3 in. while the emergency is 15 5/16 by 2½ in. Four semi-elliptic alloy steel springs carry the 7-in. pressed steel frame. The front springs are 40 by 2½ in. with 10 leaves; the rear 50 by 3 in., 16 leaves. Steering is through Ross cam and lever gear.

New 3½-Yard Hug Model

A NEW 127-in. wheelbase road builder has been added to the line of the Hug Company, Highland, Ill. This new unit, designated as Model 86, has a capacity of 8600 lb., is rated at 30 m.p.h. and is equipped with a 3½ yd. dump body with 6 in. hydraulic underbody power hoist.

The powerplant is a six-cylinder, 3¾ x 5 in. Buda engine, Model DW, developing 70 hp. at 2100 r.p.m. A Purolator and air-cleaner are furnished as standard equipment. Ignition is by magneto with impulse coupling and carburetion is through a Zenith fed by vacuum from a 20-gal. gasoline tank equipped with a sediment bulb.

The circulation system includes a centrifugal water pump and a tubular type radiator having a core 4 in. deep. The shell is of cast aluminum.

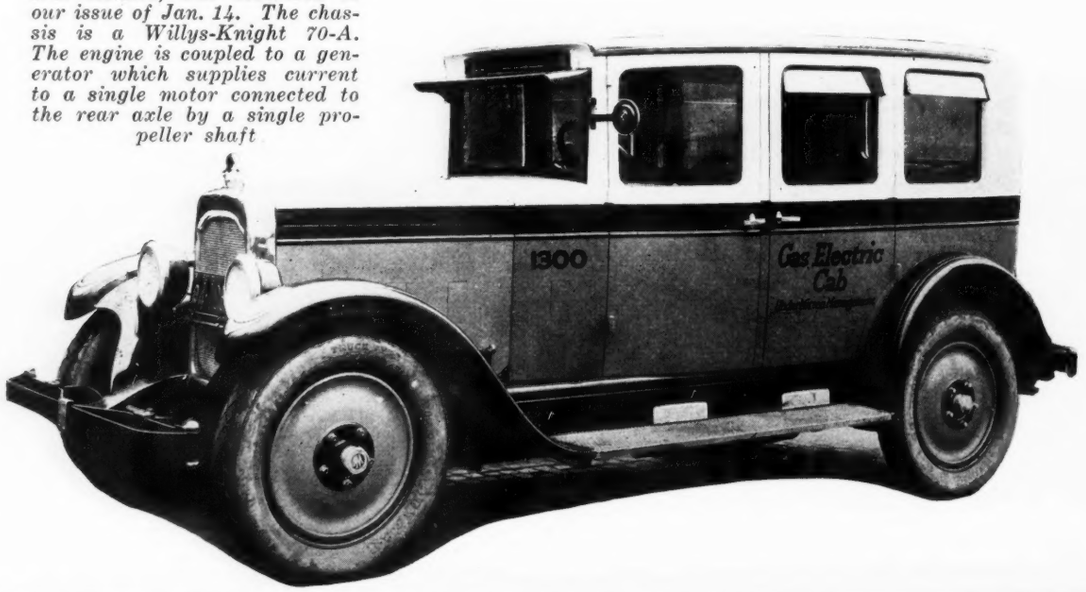
The power line consists of a multiple dry disk clutch, a five speed forward and two speed reverse transmission mounted in unit with the engine, an all-metal tubular propeller shaft and a full-floating double reduction rear axle.

Both brakes are internal and operate on separate drums. Steering is by Ross cam and lever gear. The rear suspension incorporates the Hug Multi-Cushion Relax Spring Drive with rear transverse and side springs 3 in. wide. The front springs are 2½ in. wide.

Wheels are all metal equipped with demountable rims and 36 x 6 pneumatic tires, duals in the rear. Cab, electric lights and starter or Prest-O-Lite equipment is furnished at extra cost.

Philadelphia's Gas-Electric Taxicab

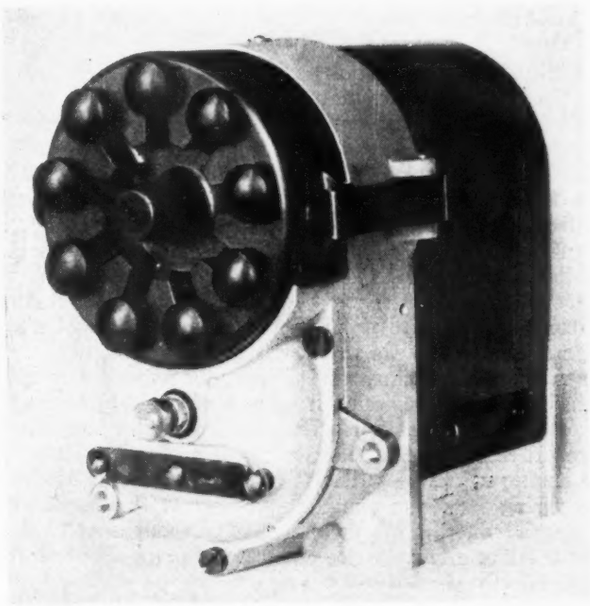
This taxicab, which has been in service in Philadelphia for several months, was described in our issue of Jan. 14. The chassis is a Willys-Knight 70-A. The engine is coupled to a generator which supplies current to a single motor connected to the rear axle by a single propeller shaft



New *Splitdorf* Aircraft Magnetos Featured by *Low Weight*

Design for use on nine-cylinder radial engines weighs less than 10 lb., while large double model which generates twice as many sparks per revolution of its rotor weighs 13 lbs.

THE Splitdorf Electrical Co. of Newark, N. J., has recently brought out two new magnetos for aircraft engines which are remarkable on account of their low weights. One is the NS-9, for the ignition of nine-cylinder radial engines, which by changing certain parts and running it at lower speeds relative to the engine crankshaft can be used also for engines with a lower number of cylinders, down to three; the other is the VA-2, a double magneto, which generates twice as many sparks per revolution of its rotor as the NS model, and can be used to provide double spark ignition for aircraft engines of from three to 12-cylinders.



Splitdorf NS-9 aircraft magneto which weighs 10 lb.

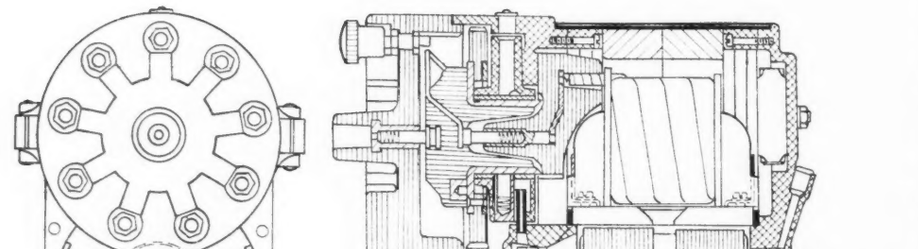
Both magnetos are of the inductor type and embody the peculiar magnetic field structure which has been characteristic of Splitdorf magnetos for many years. The primary and secondary windings are wound on a core of U shape, which is provided with separate pole pieces having polar surfaces conforming to the poles of the rotor. The rotor of the single magneto has two poles at each end, those at one end being at 90 deg. to those at the other end. At right angles to the inductor poles in the rotor tunnel are the poles of the permanent magnet. The poles of the rotor, therefore, form magnetic bridges which carry the flux from the poles of the magnet to the coil core. When a rotor pole spans both a magnet pole and an inductor pole the magnetic circuit is completed, and when the trailing edge of the rotor pole passes out from under the magnet pole or the inductor pole the magnetic circuit is interrupted. It is, of course, this opening and closing of the magnetic circuit through the coil core that results in the generation of electric impulses in the high tension coils.

The present type of single magneto for nine-cylinder engines (the NS-9) weighs not quite 10 lb., but by the substitution of cobalt for tungsten steel magnets it is hoped to reduce the weight of the complete magneto to 8 lb.

All of the cast parts of the magneto are aluminum alloy die castings, the four more important ones being the rotor, the magneto housing and the front and back plates. The breaker housing also is a die casting, while the breaker base is a bronze forging. All parts of the magnetic circuit except the magnets themselves are made of transformer stock (silicon iron) 0.008 in. thick. There are four different assemblies of these laminations, viz., the magnet poles, the rotor poles, the inductor core and the inductor poles. The rotor, which weighs 1½ lb., has a shaft made of 3½ per cent nickel steel, heat treated and ground, and is supported in Norma-Hoffman deep groove ball bearings.

The coil core, after being insulated, is wound with the primary winding at the bottom and with the secondary winding over the primary. The secondary winding consists of enameled copper wire 0.002 in. thick, and sheets of paper and varnished silk are placed between layers of wire. After the coils are completely wound they are impregnated with insulating varnish in a vacuum and then subjected to pressure in order to force the insulating compound into the coils. This process comprises a number of steps. The coils are first heated and are then placed in a cast-iron cylinder from which the air is exhausted by means of a suitable vacuum pump. By opening a valve, an insulating compound is then allowed to flow from an adjacent container into the vacuum chamber until it completely covers the coils therein. Next, by opening another valve in a pipe from a compressed air tank to the top of the vacuum chamber, air is admitted to the latter until a pressure of 90 lb. p. sq. in. is exerted on top of the insulating compound, which latter is thus forced into all of the pores of the coil. The air pressure is left on for half an hour. The coils are then removed from the vacuum chamber and baked in electrically heated ovens for 24 hours, allowed to cool, and baked a second time.

The breaker used on these magnetos is of the high-speed type and is operated by a four-lobe cam on the rotor shaft. The breaker arm itself is of spring ma-



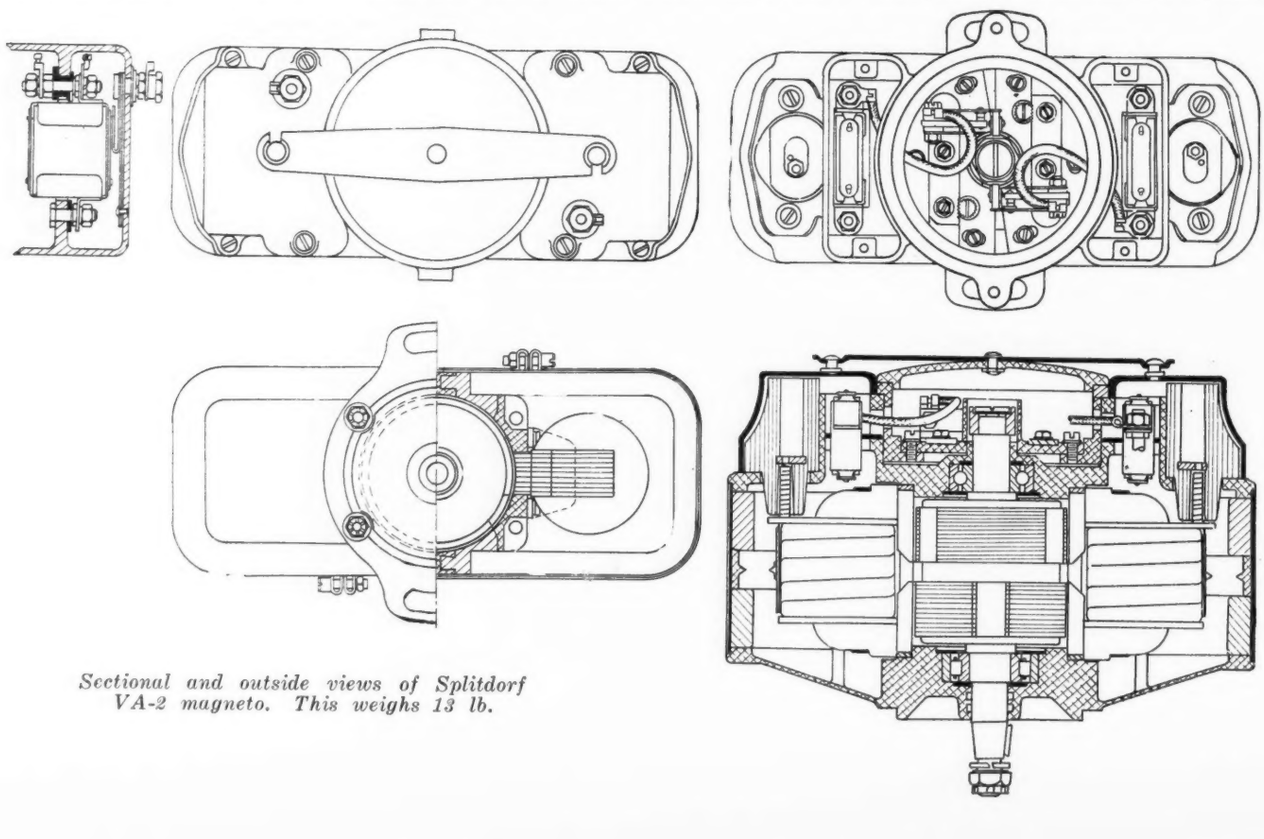
Front elevation and longitudinal section of Splitdorf NS-9 magneto

terial. Between it and the cam there is a bumper of hard fibre which is held at the end of a laminated spring, being riveted to the end of the main leaf, which is bent at right angles. The breaker points are either of precious metal (a platinum-iridium alloy) or of pure tungsten. They are adjusted to open 0.008 in. by means of a pinion and rack mechanism which moves the so-called movable breaker point in the direction of motion of the fixed point. These details are best shown in one of the end views of the double magneto.

The chief object of the double magneto is to produce two simultaneous or nearly simultaneous sparks in the combustion chamber of each cylinder. In many cases one of the spark plugs is located adjacent to or opposite the exhaust valve, while the other is similarly placed with relation to the inlet valve. It has been found that where such double ignition is employed the best results are obtained if the spark occurring near the exhaust valve is given a slightly greater advance. This is undoubtedly due to the fact that the flame travels slower in a mixture containing a somewhat greater proportion of spent gases, as does the portion of the charge near the exhaust valve. In order to make it possible to time the two sparks independently, the breaker base is made in the form of two semi-circular disks. With the double magneto two breaker arms are used which would normally be placed exactly opposite each other. However, in order to permit "staggering" the sparks by a few degrees, the semi-circular breaker bases are made with oblong holes through them, permitting one of them to be adjusted angularly with relation to the other.

The double magneto is designed for vertical mounting, which has been found of advantage from several points of view. It makes the drive very simple, as the magneto can be driven directly from the crankshaft through a pair of bevel gears, and the mounting on a machined surface on the crankcase extension is also very convenient. One magnet is placed on each side of the rotor and its housing. The arrangement of the poles in the rotor tunnel is somewhat different from that in the single magneto. In the latter, as explained, the magnet poles are at right angles to the inductor poles, but in the double magneto the angular spacing is 60 deg., it being necessary to accommodate four magnet poles instead of two. Aside from this difference, the magnetic circuit of the double magneto is quite similar to that of the single machine.

The condensers used with these magnetos are built of alternate layers of tinfoil and mica and have a capacity



Sectional and outside views of Splitdorf VA-2 magneto. This weighs 13 lb.

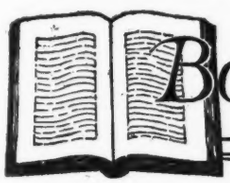
of ¼ micro-farad each. In the single magneto the condenser is placed in a pocket formed in the back end plate, while in the double magneto the two condensers are similarly placed in pockets formed in the top plate, on opposite sides of the interrupter housing.

With the latest design the distributors are separate parts and mounted on the end of the engine camshafts. There is a single high tension connection between the magneto and the distributor. In the case of the double magneto there is a single high tension cable from each coil to each distributor. These high tension cables are completely shielded to prevent interference with radio reception. At the outlet from the magneto there is an L-type fitting of die-cast aluminum, and from this to the distributor the cables are protected by tinned copper braiding. Thus all parts carrying the high tension impulses are covered by metal and the emission of waves from them is prevented.

Like all magnetos, the Splitdorf is provided with a safety spark gap which prevents the voltage in the secondary from building up to dangerous values when there is an unusually high resistance in the secondary circuit, as when the spark plug cable is disconnected. In the single magneto illustrated herewith the safety spark gap is shown to be between the service brush and a grounded spark point located on the distributor gear. With the double magneto there are two such safety spark gaps, each protecting one of the high tension windings. Owing to the fact that if there is repeated sparking at the safety gap in an inclosed space, the air within this space becomes ionized and then loses much of its electrical resistivity, permitting the spark to pass at the safety gap at much lower voltages than normally, it is necessary to ventilate the inside of the magneto.

There is some objection to having the safety spark gap exposed on the inside of the magneto, for the reason that the sparks produce nitrous oxide which attacks the cuprous materials, forming copper nitrate. In the latest design, therefore, the safety gap is located inside a small porcelain tube which is immune from attack by the nitrous oxide. However, owing to the reduced space within the tube the air therein would become ionized very quickly if sparks should pass and effective ventilation were not provided. This ventilation, however, must be effected in such a way that there is no possibility of the sparks at the safety gap igniting any combustible mixture that may be present in the vicinity of the magneto. This is accomplished by ventilating the chamber through a long, small-diameter hole in the metal housing of the magneto, which will quench any flame that may start inside the spark gap housing before it reaches the atmosphere.

The distributors used with these magnetos also distribute the spark from an auxiliary starting magneto. This spark enters the distributor by way of a bronze ring molded in the housing and is picked off therefrom by a radial rotating electrode, or "brush." This latter connects with another rotating electrode, the point of which sweeps past the distributor sectors. The starter "brush" trails behind the service "brush" in such a way that the starting spark occurs in the cylinder when the piston in it is on the down stroke, so that the engine cannot possibly start in the reverse direction.



Books for the Business Bookshelf

Corporation Finance

Finance. Charles L. Jamison. The Ronald Press Co., New York. 377 pp. $4.50.

THIS book is designed to give to corporation treasurers a survey of the problems with which they are confronted in the details of handling the corporations' working capital and to offer suggestions as to how these problems can best be met.

Most emphasis is placed upon the circulation of working capital which, in the author's opinion, is the main function of business finance. Chapter headings include: Management of working capital; credit investigations; collections; banking connections; long-time financing; payroll methods; property insurance; corporate records, etc.

Aerial Photography

Aerial Photographs. Dache M. Reeves. The Ronald Press Co., New York. 312 pp. $5.

AERIAL photography has become a very important by-product of aviation progress, providing, as it does, a quick and accurate method for mapping and obtaining various items of information regarding the terrain which might be very difficult or impossible to obtain otherwise. The first part of this book discusses the characteristics of aerial photographs with information as to how they may be taken, how to read them, the influences of light and shade, elevation, natural features and other things upon the print. The second part treats the military applications of aerial photography and gives considerable information on how it may best be used for all sorts of military services.

How to Analyze Oils

Oil Analysis. 11th Edition. Augustus H. Gill. J. B. Lippincott Co., Philadelphia. Illus. 293 pp.

THIS is a concise manual for the analysis of the more common animal, vegetable and mineral oils and in addition to describing the methods used in applying physical and chemical tests, gives particulars regarding their preparation, properties, analytical constants, uses and adulterants. For automotive engineers interested in fuel and lubricating oils this book should prove a fruitful source of information.

Revised Edition on Auditing

Auditing—Theory and Practice. 4th revised edition. Robert H. Montgomery. The Ronald Press Co., New York. 859 pp. $6.00.

THE last revision of this standard textbook for auditors and accountants was made in 1921 when the effects of the war were still playing a large part as a source of auditing problems. These have now disappeared to a large extent and new problems which have arisen to confront the auditor are treated in this volume.

AUTOMOTIVE NEWS SECTION INDUSTRIES

Philadelphia, Pennsylvania

March 17, 1928

Factory Production Levels Well Above 1927 Operations

PHILADELPHIA, March 17—The automobile industry appears to be following a fairly normal course for this time of year. Factory production has been speeded up in accord with the seasonal trend and is now well above the levels of a year ago, when conditions were generally unfavorable and dealers' stocks high. Although retail sales have not been accelerating at the rate of manufacturing gain, the market has not yet had the test of a good period of spring weather.

February production by all companies is estimated at 345,000 car and truck units, against 323,408 in February, 1926, when Ford was operating at a considerably higher rate than now. Last month's figure compares further with 254,302 units for the industry in January. Another impressive gain will be recorded this month.

While the industry is not likely to reach theoretical capacity output, and is still under the best marks of its history, a number of factories are bending every effort toward still higher rates of output, being limited only by delays in receiving parts and materials and the need for training the added workers in production processes.

Genuine demand from the field is responsible for high production in some instances and in all cases the need for giving dealers a good supply for the spring business is felt. In a few lines there are delays in delivering cars ordered by new buyers.

Marvel Carbureter Buys Wheeler-Schebler Control

INDIANAPOLIS, March 12—Control of the Wheeler-Schebler Carburetor Co. has passed to the Marvel Carbureter Co., Flint, according to a statement by D. F. Wheeler, president of Wheeler-Schebler. The purchase price was indicated as more than $1,000,000. The two properties will be consolidated to form one of the largest carburetor manufacturing companies in the industry. No statement has been issued by Marvel as to plans for the future operation of the acquired company.

Ford Wins German Action

DETROIT, March 14 — Word has been received here that the Ford Motor Company of Berlin has won a court decision against the German Federation of Auto Industrialists, which has been questioning whether the new Ford automobile complies with German law regarding brakes. A temporary injunction granted Feb. 25 against advertising or publicly intimating that the new Ford car conformed with German requirements has been recinded.

Tax Relief Action Doubted by Smoot

WASHINGTON, March 15—Doubt as to the prospects of tax relief by the present Congress was expressed this week by Chairman Reed Smoot of the Senate finance committee. The tax reduction program passed by the House would repeal the 3 per cent excise tax now levied on passenger cars.

Chairman Smoot announced that the House bill would not be taken up by the committee until March 25, which, he declared, would be the earliest date that the government would have available a tabulation showing the results of the March 15 tax returns. A preliminary survey conducted by an official agency, he said, shows that there will be a loss of approximately $190,000,000 in receipts this year on corporation tax returns alone. The House bill provides principally for a slash in corporation taxes. The elimination of the automotive tax amounted to approximately $60,000,000, being the largest single item.

Motor Wheel Promotes Siegfried and Porter

DETROIT, March 14—Directors of Motor Wheel Corp. were reelected at the annual stockholders' meeting on Tuesday, and the directors have voted to set aside 50,000 shares of stock for distribution to employees on a basis which will be determined later. J. B. Siegfried was elected vice-president in charge of sales. He has been general sales manager and a director since the organization of the corporation. D. L. Porter was elected vice-president and treasurer, succeeding B. S. Gier.

Declares 6 for 1 Split

TOLEDO, March 14—The City Machine & Tool Co. has announced an increase in its capital stock to 150,000 shares and a six for one split-up for shareholders. The new stock will be put on a $1 annual dividend basis. Last year the company had net profits of $2.49 a share.

Studebaker Prices Increased $15-$25

SOUTH BEND, March 15—The Studebaker Corp. of America has advanced prices on all its models to include the cost of bumpers and other equipment which formerly were not included in the list prices. New prices on the three Studebaker lines are increased $25 and the new price on the Erskine line is $15 over the former list.

Graham-Paige Production Exceeds 300 Day Level

DETROIT, March 14—Graham-Paige Motors Corp. attained a new high production mark last week, when for the first time a single day's output exceeded 300 units. The largest production for one day was 311 cars. There are now 3030 employed in the main plant in Detroit, which is 480 more than were ever before on the Paige payroll during its 18 years' history. In addition, the new Graham-Paige body plant at Wayne, near Detroit, employs 1086 men, making a total for the two plants of 4116. This total does not include office employees.

Autocar Builds New Six for High Speed Service

PHILADELPHIA, March 14—A new 2½-ton model, designated as Model T, has been added to the line of the Autocar Co., Ardmore, Pa. This new unit, powered by a 4¼ x 4¾ in. six-cylinder engine, was designed especially for high-speed, long-distance service. A feature of the model is a dual range transmission, mounted back of the regular four-speed transmission, which gives a total speed range of eight. Pneumatics with dual rears are standard, being 34 x 7 in. all around. The wheelbase is 213 in. and the length back of the seat to end of frame, 17 ft.

Boston Attendance Large

BOSTON, March 14—Attendance at the Boston automobile show this year for the first half of the week was larger than for any previous exhibition. Distributors and salesmen were satisfied with the orders booked at the show, although they were not so large as had been anticipated. Conservative dealers said that business was on a par with their expectations based upon the big business done during January and February, particularly following the Washington's Birthday open house sales.

New Interests Buy Control of Peerless

Will Take Over Property at Annual Meeting—Seek Cleveland President

DETROIT, March 16—Detroit and Cleveland interests have obtained control of Peerless Motor Car Corp. according to a statement today by Alfred W. Wallace, Detroit investment banker. The announcement added that the new owners will formally take control April 3 at the annual stockholders' meeting in Richmond, Va., and that their plans contemplate continuing the Peerless plant in Cleveland.

Mr. Wallace said of the purchase:

"For some time I have believed that the stock of Peerless Motor Car Corp. had attractions from an investment point of view. Acting on that belief I have from time to time acquired a considerable number of shares of stock in that company. Quite recently I have found others who entertained the same belief and in connection with them I have been instrumental in purchasing a substantial interest in the company, including the so-called Peckham stock. Those associated with me comprise a comparatively small group made up of Cleveland and Detroit business men. Two of the Detroit men are connected with Continental Motors Corp. but that company, as such, has no part in the activities of the group. It is equally true that W. C. Durant is not a member of this group and, as far as I know, he is not even a stockholder of the Peerless company.

Will Strengthen Personnel

"Our influence will be exercised in the direction of strengthening the present organization without making radical changes in the personnel. Plans and policies of a constructive nature are now well under way, including the selection of a strong, aggressive, Cleveland man for president. No definite statement on this subject can be made at this time further than this—that there is no thought of selecting any ex-president to be the company's head. The report that there is in contemplation a plan to move the business of the company away from Cleveland is without any foundation.

"It is true that negotiations are pending for the use eventually of the Argyll single-sleeve valve engines in Peerless cars. If satisfactory arrangements to this end can be worked out the Peerless company will be in a most enviable position in the automobile trade."

R. W. Judson, president of Continental Motors Corp., said:

"Statements to the effect that Continental Motors Corp. is a heavy purchaser of stock in the Peerless Motor Car Corp. is false. Aside from 500 shares purchased more than six years ago, this company does not own any stock in that company.

"That a merger or consolidation of Continental and Peerless or Jordan is contemplated is also untrue. As long as the present management is in control, this company will continue to be an independent manufacturer to the trade. This company is interested in Peerless as a purchaser of Continental engines. To this extent it is concerned with the success of that company.

"A group of Detroit and Cleveland men, including myself, have acquired a stock interest in Peerless as we are of the opinion that the purchase of that stock constitutes an attractive investment. They have it in mind also that pending negotiations may result in a deal between Continental and Peerless which will enable the latter to use the single sleeve Argyll motor which is controlled by Continental.

Negotiate for Argyll

"W. R. Angell, vice-president of this company, has for several years been a director of Peerless and has taken an active interest in the affairs of that company. Owing to the relations between the companies, no doubt Mr. Angell's activities in the Peerless company will continue—at least for the immediate future.

"We have not been advised that W. C. Durant has acquired directly or indirectly an interest in the Peerless company and we do not believe that he has. Neither is he a stockholder of Continental Motors, at least so far as the records of this company reflect the facts. To our knowledge he has not purchased any of the stock of this company for a long time. We enjoy a cordial relationship with him as the manufacturer of engines used by him, but aside from this there is no connection between him and this company."

G.M.A.C. 1927 Profit Rises to $8,578,475

NEW YORK, March 14—Net profit of General Motors Acceptance Corp. for 1927 was $8,578,475 against $5,193,203 in 1926. This represented 1.02 per cent earned on the 1927 volume of $842,819,877 as against .82 per cent earned on the 1926 volume of $631,543,573. The per cent earned on capital funds increased in 1927 to 19.04 as against 18.98 in 1926.

Assets as of Dec. 31 showed cash of $45,975,161; notes and bills receivable $275,730,233; accounts receivable $999,046, and investments $3,257,702. At the end of 1926 cash totaled $37,930,068; notes and bills receivable $232,125,079; accounts receivable $505,410, and investments $81,000.

The company opened 15 new branches in 1927 bringing the number in operation to 62. New branches now being organized will bring the total to 75. Credit experience during the past year has been generally satisfactory, C. C. Cooper, president, said.

Business in Brief

Written exclusively for* AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co.

NEW YORK, March 15—The advent of more seasonable weather has brought about an increase of trade in some localities, but as yet no marked general improvement has appeared. The situation remains highly irregular, with some branches of business in an excellent position and others severely depressed. Retail trade reports continue fairly satisfactory.

FREIGHT CAR LOADINGS

Railway freight car loadings are still below the level of last year. During the week ended Feb. 25, which was a holiday week, loadings totaled 869,590 cars, or 18,301 cars less than in the preceding week and 49,268 cars less than in the corresponding period last year. On the other hand, commercial check payments, as measured by bank debits to individual accounts in 140 cities, excluding New York, during the first week of March were 12 per cent larger than a year ago.

FEDERAL RESERVE REPORT

Stock prices continued to mount rapidly last week and early this week. The renewed strength may have been partly due to the announcement of a further decline of $26,000,000 in New York City brokers' borrowings during the week ended March 7. Total loans and investments of reporting member banks of the Federal Reserve system declined $18,000,000, notwithstanding a gain of $59,000,000 in "all other" (mainly commercial) loans. There were small declines in all categories of Federal Reserve credit outstanding, the aggregate decrease in bill and security holdings of the reserve banks amounting to $21,000,000.

MONEY

A total of $33,000,000 in gold was exported from the United States in the first week of March, bringing aggregate shipments since the first of the year up to $110,000,000. Money rates were practically stationary last week.

FISHER'S INDEX

Commodity prices, according to Professor Fisher's index, remain firm, the level on March 10 being 96.8 per cent of the 1926 average, as against 96.9 a week earlier and a peak for the year of 97 a month ago.

COTTON SALES

Continued readjustment of the production of standard cotton cloths to current demand is reflected in the statistics for February compiled by the Association of Cotton Textile Merchants of New York. The ratio of sales to production last month was 20 per cent higher than in January.

There was a slight increase in crude oil production during the week ended March 3, average daily output for the period amounting to 2,356,750 bbl., as compared with 2,349,150 bbl. a week earlier.

Rim Output Shows Early Year Increase

Total for First Two Months Shows Increase of Almost 400,000

CLEVELAND, March 12—Automobile rim production in February totaled 1,806,437 as against 1,753,224 in February last year, according to the report of the Tire & Rim Association of America. Production in the first two months this year was 3,617,971, as against 3,242,242 in the first two months last year.

Every classification showed a gain over 1927 except the 21-inch balloon, this size dropping from 973,215 in February, 1927, to 641,445 in Feburary, this year. Comparisons in leading sizes follow:

	Feb. 1928	Feb. 1927
Clinchers		
30 x 3½	29,749	76,665
18" Balloon		
18 x 4	76,346	53,165
19" Balloon		
19 x 3½	136,358	51,957
19 x 4	165,779	15,523
19 x 4½	118,669	60,108
20" Balloon		
20 x 3½	58,845	8,872
20 x 4	264,751	249,745
20 x 4½	35,404	29,314
20 x 5	32,399	22,739
20 x 6	21,906	.....
21" Balloon		
21 x 3½	36,225	625,162
2.75-21D	477,346	.....
21 x 4	78,769	205,558
21 x 4½	48,564	107,871
20" Truck		
30 x 5.20	137,495	135,571
32 x 6.20	21,722	14,920

Dutch Growers' Attitude Causes Rubber Disquiet

NEW YORK, March 12—Little can be expected from Dutch interests in the way of cooperation with the British in rubber growing restrictions, according to the weekly report of the rubber market issued by F. R. Henderson Corp. Heavy selling in London last week, due to the growing conviction that this cooperation will be unobtainable, resulted in further declines in price with a fairly steady tone toward the end of the week.

In addition to Premier Baldwin's committee for the study of the restriction scheme, the British House of Commons has appointed its own committee to carry on a similar investigation.

Arrivals of crude rubber in the United States during February were estimated at 32,300 tons, with arrivals in March, up to the tenth, placed at 12,600 tons.

Cadillac Sales Gain 200%

DETROIT, March 10—The Cadillac Motor Car Co. reports a 200 per cent gain in sales of custom-built bodies for the six months' period ended March 1. In sales of custom-built town cars the increase has been 500 per cent.

Ford Canada Plant Nearing 200 Daily

OTTAWA, March 12—According to announcement at Ford City, Ont., production of Ford Motor Company of Canada, Ltd., reached 100 cars a day during the week of March 5, the output during the previous week having been 70 Ford cars per day. A schedule of 200 cars daily was promised by the end of March. The situation at the Canadian Ford plant had reached the point where shipments for export were included in the factory schedule while new models were being shipped to principal points from coast to coast in the Dominion.

Hupp 1927 Earnings Shown as $2,719,164

NEW YORK, March 12—Net income of Hupp Motor Car Corp. for 1927 was $2,719,164 after all charges. This compares with $3,507,629 in 1926. Sales in 1927 totaled $44,734,430 as against $50,342,607 the year before. Current assets of $15,432,000 were more than five times current liabilities and net working capital of $12,582,551 was the largest in the company's history.

DuBois Young, president, in his statement to stockholders said:

"During the last quarter of 1927 we introduced an entirely new line of six-cylinder cars which was enthusiastically received by distributors and by the public, and resulted in shipments during the last three months of 1927 exceeding shipments of any corresponding period during previous years. We look forward to 1928 with great confidence."

Earnings in the last quarter of 1927 were $1,131,262 after all charges, the equivalent of $1.13 a share, against 43 cents a share for the final quarter of 1926.

Hercules Units Destroyed

CANTON, OHIO, March 10—Fire this week swept the plant of the Hercules Motor Corp., entailing a loss upward of $100,000. Loss included 350 completed engines. There was also heavy loss in plant equipment. Efforts will be made to proceed with the work of the razed departments in temporary quarters elsewhere in the factory.

Overseas Club Sees G. M. Film

NEW YORK, March 10—The Overseas Automobile Club witnessed a showing of the General Motors Export Co. film, General Motors Around the World, at its regular monthly meeting in the Hotel Astor this week.

Steel Mills Pressed for Sheet Deliveries

Fair Volume of New Business at 4.15 Cents Reported—Outlook Cautious

NEW YORK, March 15—While pressure for sheets from automotive consumers is so great that finishing mills insist upon longer time between specification and shipment, sentiment as to the outlook for the steel market as a whole is exceedingly cautious. In full finished automobile sheets a very fair volume of new business is reported to have been closed at the new 4.15 cent price level, but considerable tonnages of 4.00 cent sheets are still being shipped.

Hot strip mills are operating at close to capacity on current quarter contracts. Second quarter commitments are running light and the impression prevails that buyers will carry considerable first quarter strips over into second quarter. Prices hold steady. Shipments of cold-rolled strip steel run heavy but, here too, second-quarter buying remains in abeyance.

There is considerable talk of an early advance in the price for billets and sheet bars which for many months have ruled unchanged at $33 and $34, respectively. If sheet-rollers succeed in booking a representative volume of business at the higher second quarter prices announced some time ago, it is quite probable they will be confronted by advances in the market for their semi-finished material.

Pig Iron—The movement of iron to automotive foundries is brisk. The Michigan market is firm at $18, furnace, but at other points considerable price-shading is in evidence.

Aluminum—Importers report better demand from automotive consumers, and the sole domestic producer is thought to be making heavy shipments to the two leading low-priced motor car manufacturers. Business in aluminum sheets is light.

Copper—Somewhat improved demand has imparted a better tone to the market. Export sales have also broadened. Prices show a moderately firmer tendency.

Tin—The market's statistical position is decidedly in buyer's favor.

Lead—Storage battery manufacturers figured prominently as buyers recently. The undertone of the market is strong.

Zinc—Joplin reports indicate that producers are whittling down their output, so as to lighten the market's burden.

Olds on Record Schedule

DETROIT, March 10—Oldsmobile production and shipments will set a new all-time record in March, according to factory executives. Schedules call for the production of more than 8000 units for domestic shipment. During the first 10 days of the month the daily average to total this allotment had been exceeded in number of cars manufactured and shipped.

Cincinnati Business Gains on 29th Day

New and Used Car Registrations Show Increases Over Former Year

CINCINNATI, March 12—Automobile registrations in Cincinnati showed an increase in February over the same month in 1927 with the aid of the extra leap-year day, figures in the office of the county clerk showing a total of 1178 new car sales during the month, compared with 1111 last year. Without the extra day's registrations, figures for this year were 1107, four less than during the 28 days in the month a year ago. Even this is gratifying to motor car dealers, who feel that business has snapped out of the depression that has existed since September and became particularly acute in January, when sales were 50 per cent under those of January a year ago.

Used car sales were especially good in February, registration figures showing a total of 4125 for the month as against 3852 a year ago. Without the added day, 28 days in February revealed registrations of 3971 used cars, an increase over the same period in 1927 of 119. Used car inventories in the case of most dealers are low and they are in good shape to handle trade-ins that will be involved in spring marketing of new cars.

Cleveland Sales Increase

CLEVELAND, March 10—An increase in new car sales for February over the same month last year is noted in the report of the Cleveland Automobile Manufacturers & Dealers Association, 2303 cars being sold this year, against 2228 in February, last year. Used car reports show 8346 sold in February 1928, against 8095 in February, 1927.

Packard Sales Gain in N. Y.

NEW YORK, March 10—Packard Motor Car Co. of New York held its annual sales meeting preceding the spring drive March 6. Alvan Macauley, president of Packard Motor Car Co., was the guest of honor. He was accompanied by R. E. Chamberlain, general sales manager. Sales during the past two months exceeded those of the corresponding months last year by 70 and 101 per cent, respectively, according to executives.

Durant Adds 1500 Men

NEW YORK, March 10—Durant Motors, Inc., has taken on 1500 additional men during the past two weeks, according to J. P. McCarthy, factory manager. The force now employed numbers between 3500 and 4000. February orders from dealers for the new Star and Durant models are greatly in excess of production and a third assembly line will probably soon be put in operation, he said.

Name Plate to Show German-Made Cars

WASHINGTON, March 10—So serious has become competition from the outside world, German automobile manufacturers and dealers have hit upon what they regard as a unique scheme which will materially aid their sales. The plan is for all German manufacturers to prominently place upon their product a plate showing that the car was made in Germany. It is planned that the plate shall be equally as large as the customary name plate of the maker and as prominently displayed. This will be coupled with a patriotic appeal for German people to use German-built automobiles.

Tariff Commission Nears Report on Plate Glass

WASHINGTON, March 14—The U. S. Tariff Commission will soon take up the question of readjusting tariff rates on plate glass, the commission announced this week. The question is regarded of considerable importance to the automobile industry, because of the fact that approximately 50 per cent of the total plate glass production of the country is used by the automobile and body manufacturing industries. Most recent figures reveal that during 1926 the total production was 128,857,000 sq. ft., of which 64,500,000 sq. ft., was used in the automobile industry.

The commission has just completed two years' investigation in connection with the domestic cost of plate glass and will soon complete data covering foreign cost. This foreign cost data, the commission stated, is expected to be received within the next two weeks, following which a report will be made and submitted to the President.

Italian Operations Low

WASHINGTON, March 14—Italian automobile manufacturers were reported operating on very limited schedules, according to a cable to the automotive division of the Department of Commerce from its representative in Rome. The department is advised that several consolidations and reorganizations of smaller manufacturing companies are pending and that the time is propitious for American manufacturers to establish agencies in that country.

W. A. Marty

DETROIT, March 10—W. A. Marty, 49 years old, manager of the General Motors steering gear plant at Saginaw, died suddenly Wednesday. Before joining General Motors he had been associated with the Hudson, Studebaker and Ford companies.

K.C. Wrecking Yard Issues Parts List

Company Standardizes Used Parts Business and Sales Reach $300 Daily

KANSAS CITY, March 10—The United Auto Wrecking Co., the Kansas City dealer owned wrecking company, has been declared one of the most successful dealer owned salvage companies in the United States by a large motor car manufacturing organization. This manufacturing organization has made a survey over a period of several months. In a report the Kansas City company is headed as "Yard No. 2." The company is credited with leading the field in many respects.

The United Auto Wrecking Co. purchased 7 per cent fewer cars than two other dealer owned companies during the period of the survey but paid the dealers 37 per cent more for the cars handled. Also, the gross income of the Kansas City company was 26 per cent above that of the other yards. The United Company spent 98 per cent more in advertising than any other such company.

In October last year the United company made the first attempt to standardize the used parts business in Kansas City by issuing a catalog and price list. This was distributed over a wide area in the Kansas City territory and the response was immediate. Sales increased until they averaged $300 a day by the last of December.

Commercial Car Exhibit Draws 600 Throng Daily

PHILADELPHIA, March 12—A daily average of 600 visitors attended the two-week automotive transportation exhibit concluded by Thornton-Fuller Auto Co., Dodge Brothers and Graham Brothers dealers here. The display included 148 chassis equipped with bodies for service in practically all lines of business. Valued at $225,000, the exhibit covered 44,000 sq. ft. of floor space.

Thornton-Fuller Company attributes 129 sales directly to the show, exclusive of those made by dealers in neighboring communities. While figures are not available it is believed that many deals were closed by dealers, who brought their prospects to the show. Although sales resulting directly from the show were gratifying to the company, the management feels that the educational effect was of greater significance, the benefits of which would be felt through the remainder of the year.

Completes Radiator Plans

NEW HAVEN, CONN., March 10—Winchester Repeating Arms Co. is completing plans for the expansion of the radiator business recently acquired from the U. S. Cartridge Co.

Men of the Industry and What They Are Doing

Truck Outlook Outlined by Blanchard to N.A.C.C.

Prospects for truck sales were discussed this week by Donald Blanchard, editor of *Commercial Car Journal*, before the truck manufacturer members of the National Automobile Chamber of Commerce. Summarizing a recent survey Mr. Blanchard said that sales were reaching their highest levels relatively in the Southwest and Southeast with business in the Central States apparently running somewhat ahead of last year for makes other than Ford. He also presented an analysis of market trends as evidenced by the growth in registrations in various parts of the country. Other speakers on the program included C. W. Stocks, Bus Transportation, and Pyke Johnson, O. P. Pearson and Edward F. Loomis of the N.A.C.C. staff. D. C. Fenner of Mack Trucks, Inc., presided.

Michaux Visits duPont

Cesare Michaux, vice-president of the Societe Francaise Duco and a director of Nobel Chemical Finishes, Ltd., of England, is in the United States to discuss business with officials of E. I. duPont de Nemours & Co., Inc., and to spend some time at the company's plant at Parlin, N. J. The French company now has a plant making Duco, at Stains near Paris, and the English company is also operating. A third company named, Duco Societa Italiana, has been formed and is constructing a plant near Turin, Italy, which will be in production shortly. Mr. Michaux will remain in the United States for about a month.

Myers Leaves Chrysler

Henry T. Myers has resigned as director of sales of the Chrysler Sales Corp. to devote his time to private interests. He had been associated with Chrysler for several years and is well-known throughout the automotive industry due to his long association with the motor car business.

Speh District Manager

E. J. Speh has been promoted to the position of Cleveland district manager of the White Co. Mr. Speh has been with the White Co. since 1916, in charge of the sales promotion and chassis distribution departments. He formerly was with the Bell Telephone Co. of Philadelphia as superintendent of motor vehicles.

Stakgold Coming to U. S.

Henrl Stakgold of Corneliussen & Stakgold, Olso, Norway, manufacturers' representatives operating in continental Europe, will arrive in New York April 22 on a business trip on which he is looking for new parts and accessories, especially for the new Ford.

Buick Men Donate Bassett Memorial

As a memorial to the late Harry H. Bassett, who was president of the Buick Motor Co. when he died two years ago, workers in the Buick factories have raised a fund of $8,000 to furnish an entire floor of the new Hurley Hospital in Flint. The floor will be known as the Bassett Memorial Floor and a suitable bronze tablet in his memory will be installed.

Named to Graham Board

W. H. Neeley and F. R. Valpey have been elected directors of Graham-Paige Motors Corp., filling a vacancy caused by the death of Z. F. Graham, deceased, and the increase in the directorate from nine to ten members. R. C. Hicks has been named assistant treasurer.

Boyd With Metal Specialties

Carl D. Boyd, for seven years chief sales engineer of the Kellogg Switchboard & Supply Co., has been made general sales manager of the Metal Specialties Mfg. Co., Chicago. From 1916 to 1920 Mr. Boyd was president of the Southern Electric Supply Co., an electrical jobbing house at Atlanta.

Lawrance Gets Trophy

Charles L. Lawrance, president of Wright Aeronautical Corp., was honored this week when President Coolidge gave him the Collier Trophy, awarded by the National Aeronautical Association. The award was made at the White House and was attended by Government officials.

Ryder Named Sales Head

Samuel E. Ryder has been appointed sales manager of the J. C. Black Mfg. Co., Inc., Oil City, Pa., manufacturer of Standitall radiators. James A. Miller has been named equipment manager with headquarters at the factory.

Velie Appoints Representatives

A. S. Rowe has been appointed by Velie Motors Corp. as representative in the Pittsburgh district, and W. P. Fleming has been named representative in the Spokane district. Both have been connected with Velie previously.

Byers Joins G.M. Export

A. D. Byers has been transferred to General Motors Export Co. from Fisher Body Corp., and is sailing for Sao Paulo, Brazil, where he will undertake construction engineering work.

Oakland Names Bullock Service Sales Manager

H. F. Bullock has been named manager of service sales of the Oakland Motor Car Co. For the past nine years Mr. Bullock has been with United Motor Service. During the three years following the war he was field organizer for United Motor Service before becoming manager of the New York branch. For the last three and one-half years he has been at the Detroit headquarters, where recently he was appointed manager of the Delco-Remy-Lovejoy shock absorber sales. In his new position with Oakland he will specialize chiefly on the sale of parts, accessories and service.

Velde Joins Stearns-Knight

Leslie H. Velde of Chicago has been appointed middle west sales representative of the Stearns-Knight Sales Corp. Mr. Velde had been associated with the Pierce-Arrow organization in that territory for the past 11 years and has been connected with the industry for 20 years.

Wilson Back in Pontiac

D. R. Wilson, vice-president and general manager of the Wilson Foundry & Machine Co., has returned from Long Beach, Cal., where he has been spending the winter. Mrs. Wilson will return to Pontiac later in the spring.

Kreis Marmon Engineer

Pete Kreis, one of the new school of American racing drivers, has joined the engineering department of Marmon Motor Car Co. and will be associated with Earl Cooper in experimental work.

Mull Heads Falcon Zone

E. B. Mull has been appointed zone manager of Falcon Motors Corp. to take charge of a new zone being formed in Southern states. Mr. Mull has been associated with various motor manufacturers in field work in the past few years and is well known to dealers in all parts of the country.

Ornstein on Visit Here

Paul W. Ornstein, continental Europe sales representative of Guiterman Co., Inc., export agent, will arrive in this country early in April to renew acquaintance with the automotive parts and accessory manufacturers that his company represents, and to open up some new connections.

Olds Gives $30,000 More

R. E. Olds, chairman of the board of Reo Motor Car Co., has added $30,000 to his original $100,000 gift to Kalamazoo College for the completion of a new science hall.

G.M. February Sales Show 29.4% Increase

Practically All Car Divisions Share Gains, Says Sloan in Statement

NEW YORK, March 14—Retail sales by General Motors dealers in February totaled 132,029 cars as against 102,025 in February last year, an increased sale of 30,004 or 29.4 per cent. Sales by corporation divisions to dealers in February totaled 169,232 as against 124,426 in February, 1927, a gain of 44,806 units or 36 per cent. Gains by practically all car divisions contributed to this increased business, A. P. Sloan, Jr., said.

Sales to dealers and users compared with the two previous years follow:

Dealers Sales to Users	1928	1927	1926
January	107,278	81,010	53,698
February	132,029	102,025	64,971
March		146,275	106,051

Divisions Sales to Dealers	1928	1927	1926
January	125,181	99,367	76,332
February	169,232	124,426	91,313
March		161,910	113,341

Brockway to Recapitalize for Expansion Purposes

NEW YORK, March 14—Brockway Motor Truck Corp., which recently consolidated with Indiana Truck Corp., for expansion purposes has been recapitalized so that its authorized capitalization is $3,000,000 par value convertible preferred stock and 500,000 shares of common stock without par value, according to G. A. Brockway, president of the consolidated company. Financing of the consolidation will be undertaken by a syndicate headed by Prince & Whitely.

The Brockway plant is operating on a capacity basis, Mr. Brockway said, and the ability to handle additional business will be furnished through the Indiana plant. Orders on hand are in excess of those at the same period last year, he said.

Reeves Opposes Toll Roads

NEW YORK, March 13—Toll roads were described as an indefensible burden by Alfred Reeves, general manager of the National Automobile Chamber of Commerce, speaking before the Rotary Club of White Plains this week. If there is enough profit on a given road to make it profitable for private investors then there is enough traffic to warrant its being built as a public highway, he said.

Wilcox Shows 30% Gain

DETROIT, March 10—Wilcox Products Co. sales in February showed a gain of 41 per cent over the corresponding month of 1927, and it also was the largest month in the company's history. Sales for the first two months advanced 30 per cent over last year.

Charles W. Matheson

Who has rejoined the industry to take a newly created position in the Chrysler organization

Electric Auto-Lite Net Increased to $2,363,475

TOLEDO, March 12—Electric Auto-Lite Co. reports consolidated net income of $2,363,475 in 1927 as against $1,777,692 in 1926. Net sales were $15,762,093 as against $11,726,310. Total assets as of Dec. 31, 1927, were $7,049,911 against $7,285,592 the year previous. Cash increased from $43,914 to $106,900; receivables increased from $676,845 to $752,465, and inventories were reduced from $2,140,411 to $1,876,785. Accounts payable were increased from $354,029 to $552,909. Notes payable of subsidiaries were reduced from $1,605,000 to $157,700. Surplus was increased from $2,345,212 to $3,208,687.

Exchange Radiator Rights

TRENTON, N. J., March 14—Harrison Radiator Corp. has concluded a license agreement with the Trenton Auto Radiator Works for the exchange of manufacturing rights under four patents covering basic improvements in the construction of cellular honeycomb radiators. This concludes litigation of three years' standing.

Perfex Opens Office

MILWAUKEE, March 10—Perfex Corp., builder of heavy duty industrial engine radiators, has opened a Cleveland office in the Leader Building. A. C. Owen, formerly located in New York, will be in charge, taking over all the Ohio territory in addition to the Eastern states which he formerly covered.

Studebaker Sales $134,007,798

SOUTH BEND, March 12—Net sales of the Studebaker Corp. of America in 1927 were $134,007,798 against $141,536,652 in 1926. The total number of cars sold in 1927 was 116,740, comparing with 111,315 in 1926. Export sales increased 6.88 per cent.

Financial Notes

Motor Wheel Corp. as of Dec. 31, 1927, shows total assets of $12,984,128, compared with $13,377,286 on Dec. 31, 1926. Profit and loss surplus was $6,403,724 as against $6,153,277 the year previous. Cash totaled $1,595,809 against $1,695,030; marketable securities $483,545 against none the year previous; receivables $1,229,890 against $962,219, and inventories $2,416,148 against $3,120,514.

Doehler Die Casting Co. reports net profit for 1927 after charges and taxes of $387,577, equivalent after preferred stock dividends to $1.97 on common stock. During the year $300,000 of 7 per cent debenture bonds were redeemed and mortages were reduced by $85,000. Ratio of current assets to current liabilities, according to the balance sheet, is five to one.

Curtis Aeroplane & Motor Co., Inc., shows net profit for 1927 of $794,148, equal to $9.53 a share, on preferred and $2.53 a share on common, according to a revised statement just issued. This compares with income of $413,316, or $7.97 on preferred and 97 cents on common stock in 1926.

Gardner Motor Co. reports net loss of $110,336 in 1927 as against net profit of $11,927 the year before. Non-recurring losses of $173,705 incurred largely in development of the eight-in-line market were charged off. Sales during 1927 totaled $4,789,580 as against $4,761,959 in 1926.

Niles-Bement-Pond and subsidiaries report net profit for 1927 of $244,155 after all charges, equivalent after preferred dividends to 20 cents a share on outstanding no par common stock. This compares with $192,177, or $5.76 a share, on the $100 par preferred stock outstanding in 1926.

Auburn Automobile Co. has declared a stock dividend of 2 per cent and the regular quarterly dividend of $1, both payable April 2 to stock of record March 22. The company declared a similar stock dividend three months ago.

Managers Securities Co., which is owned by executives and officials of General Motors Corp., has purchased 200,000 shares of additional General Motors common stock at a total cost of about $30,000,000, which has been paid in cash.

H. H. Franklin Mfg. Co. reports net profit of $226,933 in 1927, after all charges, compared with $72,381 in 1926. The deficit after preferred dividends was $195,707, against $361,891 in 1926.

United States Rubber Co. reports net earnings for 1927, after charges and preferred stock dividends, of $1,024,992. Sales for the year amounted to $193,442,945, a decrease of 10¼ per cent from 1926.

Chicago Pneumatic Tool Co. earned $12.82 a share in 1927, against $12.74 a share in 1926, net income for 1927 being $1,210,106, compared with $1,226,837 in 1926. Outstanding shares were decreased during the year.

Wilcox Products Corp. has called all the outstanding 6½ per cent debentures which are due Oct. 1, 1931, for redemption April 1, 1928, at $105 and accrued interest.

Automotive Exports Constantly Climbing

Firmly Sandwiched Between Cotton and Wheat as Important Commodity

WASHINGTON, March 10—Analysis of the world trade of the United States for the year 1927, by the foreign commerce department of the Chamber of Commerce of the United States, shows that the cotton grower, the automobile manufacturer and the wheat grower supply almost 30 per cent of the total exports of $4,864,805,773.

"The automobile has become firmly sandwiched between cotton and wheat as an important export commodity and the year just closed shows that it is constantly moving upward in the scale," the chamber finds. Automobile exports increased from $320,179,000 in 1926 to $383,314,000 in 1927, an increase of 21.3 per cent. This is greater than the increase for any other of the more important export commodities during 1927. Singularly enough, exports of automobile tires increased in exactly the same proportion, going from $27,516,000 in 1926 to $33,737,000 in 1927.

"The review of foreign trade for the year also confirms the assertion that the United States is exporting more of manufactured articles. Exports of finished manufactures jumped from $1,956,784,000 in 1926 to $1,981,217,000 in 1927, a gain of nearly $25,000,000. More than half the total exports for 1927 came under the two groups, finished manufactures and semi-manufactures," the chamber states.

Canadian Tire Exports to British Isles Rise

OTTAWA, March 10—Pneumatic tires form an increasing proportion of Canada's international trade, according to the figures announced by the Canadian Department of Trade and Commerce at Ottawa. During the 12 months ended Jan. 31 last, Canada exported tires to the value of $4,335,857 to the United Kingdom, as compared with $2,958,624 for the previous 12 months. Canada's imports of tires from Great Britain during the last 12 months' period were valued at $4,547, compared with $12,190 the year before.

The balance of tire trade between the United States and Canada is the other way around. Canada's imports of tires from the United States during the last 12 months' period were valued at $366,367, as compared with $339,463. Tire exports to the United States totaled $13,096, as against $87,259.

Purchases Proving Ground

NEWARK, N. J., March 10—American-La France Foamite Corp. has purchased a large tract of ground adjacent to its factory at Bloomfield to be utilized for a proving ground.

Canadian Exports 41.2% of Production

WASHINGTON, March 14—Canadian passenger car and truck exports in January totaled $1,916,959, a gain of 23 per cent over the previous month's exports, according to revised figures furnished the Department of Commerce. The Canadian passenger car production in January was 6705 of which 1838, or 27.4 per cent, were exported. Combining the passenger car and truck production, figures show that of the 8463 units produced in January, 41.2 per cent were exported. The average export passenger car value was $701, as compared with $761 in December, the high record for 1927. The average truck value was $377.

American Cars Lead at Geneva Exhibit

GENEVA, SWITZERLAND, March 1 *(by mail)*—America will lead in the number of makes exhibited at the International Automobile Salon March 16 to 25. The show, the most important ever staged in Geneva, will include 87 makes of passenger cars from seven countries, distributed as follows: United States 33, France 31, Germany 9, Italy 6, Belgium 4, England 3, Switzerland 2 and Austria 1.

The commercial vehicle section will comprise 22 makes of trucks, eight of them American. In the motorcycle exhibits England is far ahead of all countries with 23 makes against two from the United States.

French Revenue from Cars One-Third Higher in 1927

WASHINGTON, March 14—French revenue from taxes on automobiles and gasoline during 1927 totaled $59,414,000, according to figures furnished the Department of Commerce. This was an increase of approximately one-third over the taxes from this source collected in 1926. The revenue collected from the motorists was approximately three times the total French appropriation for highways, which in 1927 totaled $22,165,000. The money collected from this is not diverted to any specific purpose such as road building and maintenance funds, as is customary in this country, but is turned into the general treasury fund.

Postal Receipts Higher

WASHINGTON, March 14—Postal receipts for the 50 leading industrial cities of the United States during February totaled $1,748,000 and represented an increase of 4.26 per cent over the receipts for February, 1927.

British Factories Working Overtime

Light Cars Enjoying Greatest Demand—American Car Prospects Favorable

WASHINGTON, March 14—Motor car manufacturers of Great Britain were reported very active during February, according to cable to the U. S. Department of Commerce from its representative in London. The cable follows: "Many light car manufacturing firms working extra shifts. Retail sales have maintained a high record and prospects are good for increasing the sales of American cars and bus chassis. Pressure renewed to induce the Government to change horsepower taxation to a fuel basis, but it is improbable that a change will be made at this time. Yearly reports of motor firms recently published indicate increased profits and a healthier tone in both the car and truck manufacturing industry."

France and Madagascar Change Tariff Ratings

WASHINGTON, March 14—Two changes in tariffs of interest to the automobile industry have been reported to the tariff division of the Department of Commerce. The French Parliament on March 2 revised certain tariff schedules to be effective March 16, among which are included new rates on tractors. These will be 250 francs per 100 kilos on tractors weighing less than 1250 kilos; 225 francs per 100 kilos on those weighing 1250 to 2000 kilos, and 175 francs per 100 kilos on those weighing 2000 to 3000 kilos. The new rate on tractors weighing over 3000 kilos remains at 85 francs per 100 kilos.

Rates on tires, parts, trucks and automobiles imported into Madagascar have been increased approximately 50 per cent, the department is advised, under the terms of the decree passed Dec. 17. In addition to increased tariff rates, a new consumption tax on trucks, automobiles and parts has been levied in that country.

Tractor Exports Increase

WASHINGTON, March 10—Exports of agricultural implements from the United States in January amounted to $7,854,691, as compared with $4,631,499 in January, 1927. The largest item in the $3,000,000 increase between the two periods is reported to be wheel tractors, a total of 6103, valued at $3,680,856, being exported in January this year.

Ford Assembly Grows

DETROIT, March 10—By the end of March production will be under way in 15 assembly plants, according to Ford Motor Co. At the present time assembly operations are under way in seven assembly plants outside Detroit.

Detroit Show Draws Many Plane Entries

List of 150 Manufacturers of Aircraft and Equipment is Expected

DETROIT, March 12 — With the opening of the All-American Aircraft Show to be held here in Convention Hall, April 14 to 21, still seven weeks away, nearly all available floor space has been reserved. While final exhibitors' lists have not yet been completed, reservations to date indicate that there will be a total of about 60 or 70 complete airplanes exhibited, in addition to exhibits of about 75 manufacturers of accessories, engines, instruments, etc. Not even the National Air Races have brought together a similar number of exhibits of modern developments in the airplane field.

The show will be modeled on the national automobile shows. Not only will the larger manufacturers be represented but many new models of airplanes and engines will make their appearance for the first time. Heading the committee is William B. Mayo, chief engineer of Ford Motor Co.; Thomas S. Merrill, secretary of General Motors Corp.; L. M. Woolson, of Packard Motor Car Co.; Harry R. Graham, of Stinson Aircraft Corp., and William E. Metzger, cooperating with Ray Cooper and Karl S. Betts, manager and assistant manager, respectively. Airplane exhibitors include:

Curtiss Aeroplane & Motor Co., Loening Aeronautical Engineering Corp., Stinson Aircraft Corp., Bellanca Aircraft Corp., Pitcairn Aviation Inc., Alexander Aircraft Corp., Fairchild Aviation Corp., Hamilton Metal Plane Co., Fokker Aircraft Corp., Advance Aircraft Corp., Ford Motor Co., Ryan Aircraft Corp., Swallow Aircraft Co., Halpin Airplane Co., Simplex Co., Lenert All-Metal Airplane Co., General Aero Corp., International Aircraft Corp., Overcashier Aircraft Mfg. Co., Gillis Aircraft Corp., ArrO-Wing Airplane Co., Mohawk Co., Central States Aero Corp., Ireland Aircraft Co., Chance Vought Corp., Travel Air Mfg. Co., Chicago Aviation Co., Wallace Aircraft Co., American Eagle Airplane Co. and the Aero Craft Mfg. Co., Inc.

Pitcairn Aviation, Inc., is exhibiting for the first time its air-cooled radial engine. Other exhibitors of engines scheduled include Pratt-Whitney Aircraft Co., Wright Aeronautical Corp. and Packard Motor Car Co. Accessory and parts manufacturers include S.K.F. Industries, Inc., Bohn Aluminum & Brass Co., Eclipse Machine Co., Robert Bosch Magneto Co., Inc., Splitdorf Electric Co., Bausch Machine & Tool Co., B. F. Goodrich Rubber Co., AC Spark Plug Co., Norma-Hoffmann Bearings Corp., Berry Brothers, and the Scintilla Magneto Corp., Inc. Other exhibitors in the accessory division range in type of product through the various industries associated with air transportation from lighting equipment through oil refining, instruments, airplane and engine parts, personal flying equipment and educational exhibits.

Maxwell Helped Appersons to Build Haynes' First Car in Kokomo in 1893

PHILADELPHIA, March 10—Funeral services for J. D. Maxwell, one of the outstanding figures of the automotive industry during the engineering period, were held this week from his home in Worton Manor, Worton, Md., where he has lived in retirement during recent years. His last appearance at a public function of the industry was to receive a medal at the decoration of the pioneers by the National Automobile Chamber of Commerce in 1925.

The late J. D. Maxwell, photographed at the testimonial to the pioneers in January, 1925

Mr. Maxwell's connection with the industry began with the building of the first car by the Apperson Brothers for Elwood G. Haynes. Before this he had been employed at Lansing by P. F. Olds & Son, builder of gasoline engines, and of which R. E. Olds was manager. He helped the Appersons and Haynes to build the car which ran successfully at its first trial, July 4, 1893.

After development of a gasoline farm tractor while living in Montreal, Mr. Maxwell returned to the United States to help organize the Maxwell-Briscoe Co., with plants at Tarrytown, N. Y., Newcastle, Ind., and Detroit. He designed the Northland and Maxwell cars and helped design the Briscoe. His design of the Maxwell was regarded at the time as epochal because of its improvement over existing types.

Maxwell-Briscoe was merged in the former United States Motor Car Co., Mr. Maxwell maintaining an interest in this company until it was dissolved. Leaving the industry he devoted himself to the development of his extensive farming property in Maryland.

Surviving are a widow and two sons, Jesse D., who lived on the farm with him, and Elmer J., who is in the automobile business in Detroit.

Larrabee-Deyo Co. Names New Officers and Board

BINGHAMTON, N. Y., March 10—New officers and directors have been installed by Larrabee-Deyo Motor Truck Co., Inc., and $100,000 additional working capital has been put into the company through the sale of stock. S. J. Marshall is president; F. R. Bump, vice-president; F. T. Macey, treasurer, and I. T. Deyo, secretary. Mr. Bump, formerly connected with the Dodge Brothers organization, will direct sales.

New directors are S. J. Marshall, T. W. Behan, H. W. Davis, R. Z. Spaulding, F. R. Bump, J. C. Clark and R. G. Pratt, all of whom are business men of Binghamton.

Preston Joins Excello

DETROIT, March 10—David H. Preston has resigned from the business staff at Detroit office of Chilton Class Journal Co. to become assistant general sales manager of Excello Tool & Mfg. Co.

Larkin Packer Company Buys Davis Boring Tool

ST. LOUIS, March 12 — Larkin Packer Co., manufacturer of expansion boring bars and boring bar cutters, has purchased the Davis Boring Tool Co., which has been in receivership. Tentative plans call for the separate operation of both plants, with the Davis company preserving its identity as a division of the Larkin company. General offices will be maintained at the Larkin plant. No changes are contemplated in the product of either plant at this time.

J. J. Larkin, sole owner, will be active head of both concerns, and J. E. Kilzer, who was instrumental in developing the improved Larkin expansion boring bar, will continue as assistant general manager in charge of operations.

Moody Gets Piston Rights

MONTREAL, March 10—Matthew Moody & Sons Co., Ltd., has secured a contract with Aluminum Industries, Inc., Cincinnati, Ohio, for the manufacture and Canadian selling rights of this company's pistons, the castings to be shipped from Cincinnati to Montreal. A Canadian market of 200,000 pistons a year is expected by the Moody company.

St. Louis Companies Start Plane Plants

Curtiss-Robertson Factory Now Under Way—More Passengers on Air Lines

ST. LOUIS, March 12—Preliminary work toward making Lambert-St. Louis Flying Field one of the ranking airports of the country is going ahead. Ground was broken last week for the new Curtiss-Robertson Airplane Co. plant, the future home of the "Curtiss-Robin," a medium priced cabin monoplane. William B. Robertson, president of the concern, announced that the factory, to cost $75,000, will be completed in 60 days. The first three of the planes to be made by the company are nearing completion at the Curtiss Aeroplane & Motor Co., Inc., plant at Garden City, L. I., and will be flight tested next month. They will be powered with OX-5 engines capable of a speed of 100 miles an hour and will have places for three persons. Robertson and "Casey" Jones, Curtiss test pilot, plan to enter one of the "Robins" in the Ford reliability tour this summer, alternating at the controls.

Equally comprehensive are the plans of the Von Hoffman Aircraft Co. for the development of its school. Plans for construction of a new concrete-floor hangar have been made and the company is awaiting assignment of space. The Wabash Railroad has completed installation of a switch to be used by the Curtiss-Robertson, Von Hoffman, B. F. Mahoney and other manufacturing concerns at the field.

All records for passenger carrying for the St. Louis-Chicago air mail line were broken the week of March 4, when a passenger was carried on every trip. On Friday afternoon two persons were in the mail cockpit, the first time two passengers have been carried on a single trip since the service began. A flat rate of $30 is charged for the trip and $50 for a round trip. Hugh J. McNally, formerly manager of the new business department of the General Warehouse Co., has been employed as traffic manager by Robertson Aircraft Corp. to stimulate patronage of the line.

Finance Curtiss-Robertson Plant

ST. LOUIS, March 10—A $500,000 preferred stock issue of the Curtiss-Robertson Airplane Mfg. Co. has been announced by Knight, Dysart & Gamble, investment bankers. The proceeds of the issue will be devoted to the erection of a plant at Lambert-St. Louis Field this summer and to provide operating capital. Curtiss Aeroplane & Motor Co., Inc., will hold the controlling interest and will supply an original plane, to be known as the "Curtiss-Robin," along with designs, jig-dies, etc., and also agrees not to sell any plane of this type for a period of five years, except through the new company.

Southeastern Europe Increases Car Use

WASHINGTON, March 15—An increase of approximately 200 per cent in the use of automobiles in southeastern Europe is reported to the automotive division of the Department of Commerce by H. H. Kelly, automotive trade commissioner in Europe. A survey just completed covering the past five years shows materially increased registrations in Bulgaria, Greece, Rumania, Turkey and Yugoslavia. During 1926, 11,820 cars were imported into these five countries, of which 70 per cent were manufactured in the United States. The survey shows that 20 American automobile companies are represented in these five countries through distributors and dealers.

Air Mail Income Increases in 1927

WASHINGTON, March 7—The average income per mile during the last six months of 1927 for air mail was $.769, according to figures compiled by the Bureau of Aeronautics of the U. S. Department of Commerce. The income per air mile for the first six months of last year was $.584. Figures of the Post Office Department show that during the first half of the year a total of 2,546,168 miles were flown and the income was $773,281. For the last six months, the mileage was 2,495,145 miles and the income $1,861,291.

The highest income was on the Key West-Havana route, the Post Office Department earning $2.92 per mile on all mail carried. The second most profitable route is between Los Angeles and Salt Lake City, the income being $1.62 per mile. The smallest income was on the Detroit-Cleveland route, the income the last six months being $.037 per mile.

Rubber Imports Higher

NEW YORK, March 14—Imports of crude rubber to the United States during February are estimated at 29,445 long tons and compare with 27,410 tons for February, 1927, according to the Rubber Association of America. Total imports for the first two months of the year are placed at 75,688 tons and compare with 73,371 tons a year ago.

Franklin Sales Gain 40%

SYRACUSE, March 10—Retail deliveries of Franklin cars since Jan. 1 are 40 per cent larger than for the same period last year and unfilled orders on hand are 54 per cent larger.

Coast Jobbers Deal Reported Nearer

A.E.A. Members Would Combine Holdings and Locate Wholesaling Chain

LOS ANGELES, March 14—The proposed merger of all Automotive Equipment Association jobbers operating in Pacific Coast States into one great corporation with a total capital of possibly $10,000,000 is reported to be nearing consummation. While none of the jobbers is willing to be quoted at this stage, it is known that all preliminary deals have been completed and that negotiations have reached a point where the possibility of the merger being concluded is "90 per cent sure."

In the event the merger is consummated, the plan of operation is unofficially but reliably reported to be as follows: Two distributing heaquarters will be maintained, one in Los Angeles and one in San Francisco. From these plants a great chain of so-called "local wholesale stores," located in the smaller towns and communities, will be served with stock. As and if the merger extends to the Northwest, another divisional headquarters will be established at either Portland or Seattle.

In planning the greatest development in the history of automotive wholesale distribution, the Western jobbers are determined to recapture the market that has been gradually slipping away through the establishment of jobbers in smaller centers. They recognize that convenience of supply is a dominant factor in the automotive wholesale business today, and plan a strong chain of automotive wholesale stores, backed by a single company of tremendous strength. In this connection, it may be stated on good authority that the proposed corporation will be financed for the most part by the pooling of the combined resources of the Western jobbers, with possibly a very small issue of securities to be offered the investing public.

Radio Dropping Batteries

WASHINGTON, March 14—A survey of radio jobbers throughout the U. S. just completed by the U. S. Department of Commerce, shows that the average jobber does an annual business of $218,000. Of particular interest to the automobile industry is the fact that, the department advises, the battery operated sets are becoming less popular.

Budd in Wheel Suit

CHICAGO, March 12—Budd Wheel Co. is named defendant in the supplemental bill filed in Federal Court here by the Wire Wheel Corp. of America to establish the rights of the Cowles patent to any type of wheel bolted on at the hub and which is held infringed by the Budd type of disk wheel.

De Luxe 8 Models Offered by Stearns

Ten Body Styles Comprise Line Which Includes Many New Features

CLEVELAND, March 12—A new de luxe line of eight-cylinder cars has been announced by the Stearns-Knight Sales Corp., made in two wheelbase lengths, 137 in. and 145 in. Both chassis will be equipped with five body styles. The prices of the de luxe series models are approximately $1,000 higher than those of the standard eight-cylinder models.

Among mechanical changes the compression ratio has been increased from 4.85 to 5 and the engine speed from 2600 to 2800 r.p.m., which has resulted in an increase in maximum engine power from 100 to 112 hp. The torque of the engine is 285 lb.-ft. at 800 r.p.m. and remains substantially constant up to 1600 r.p.m. Fuel is fed to the carburetor by an AC fuel pump. The two-plate Long clutch now has a spring-damping device. Gemmer steering gear is now used, of the Marles type. Equipment includes four Houde hydraulic shock absorbers. An option is given for the spare tire to be carried at the rear fender or in a well.

The radiator is of entirely new design and has 14 per cent more cooling area than that on the standard eight. The shell is considerably higher and narrower and is surmounted by a large filler cap (4⅝ in. diameter), devoid of ornamentation and emblems. Guide Tiltray nickeled headlights are employed. Side lights of 4½ in. diameter and matching the main lights are mounted on the body on brackets. Ventilation of the front compartment is by a shaft which carries the inrushing air forward and downward. The opening is screened to prevent admission of foreign matter and to act as a "break" for the rain.

Nash Shipments Increase

KENOSHA, March 10—February shipments of Nash cars to overseas points showed an increase of 29 per cent over February of last year, making February of this year the greatest single month in the export record of the company, Charles W. Nash, president, has announced. The increase in export orders for the month was 46.4 per cent greater than for January. It is expected that March will show an even greater increase. February also showed an increase in domestic shipments of 24 per cent over the previous February and 32 per cent over January.

British Insurance Higher

WASHINGTON, March 15—An increase in insurance rates on automobiles in Great Britain, ranging from 25 per cent down to 10 per cent became effective the first of this month, according to a report from Trade Commissioner W. M. Park to the Department of Commerce. The British insurance rate is based on horsepower, plus value and other considerations. Cars up to and including 9 hp. are most affected. The premium on this type of car is increased 25 per cent. On cars ranging from 17 to 20 hp. the increase was approximately 10 per cent.

Neglect Found Reason for Most Road Calls

WASHINGTON, March 10—Indifference in the care of automobiles is responsible for more than 50 per cent of emergency calls made to garages for assistance, according to an analysis by the emergency road service department of the American Automobile Association.

Out of 25,000 calls made during 1927 by one of the A.A.A. largest clubs, which is regarded as typical, 25.2 per cent were due to tire troubles. Of the tire troubles, 60 per cent was attributed to continued running on either over-inflated or under-inflated tires, mostly the latter. Next to tire trouble, battery and ignition trouble accounted 24.2 per cent of the calls. Of this class of ailments, a majority of the cars were found to have dry batteries. The third principal "ailment" was due to inability to start motors, attributed to dirt in carburetors, disconnected choke rods, frozen radiators and water jackets. Seven per cent of all the calls were due to being out of gas.

Building Wire Wheels

LANSING, March 14—Motor Wheel Corp. has remodeled one of its factories and now for the first time is a producer of wire wheels. While the capacity of the plant is limited it is sufficient to care for all business on wire wheels that the corporation has contracted so far this year. The plant makes it possible for Motor Wheel to provide its customers with anything in wheels, steel, wood, or wire, and all manufactured in its own plant. Previously Motor Wheel has had wire wheels manufactured elsewhere.

Detroit Man Wins Continental Contest

More Than 50,000 Entries Seek Awards in National Shows Competition

DETROIT, March 14 — Robert S. Smith, 26-year-old salesman, was the winner of the contest staged by Continental Motors Corp. in connection with the New York, Chicago and Detroit automobile shows. Mr. Smith is a Detroit resident. The prize was a Continental-engined sedan, and Mr. Smith's choice was a Moon 8-80.

More than 50,000 contest blanks were distributed by Continental at the shows and by mail. Of this number about 4000 were returned sufficiently well prepared to win consideration. Contestants were required to submit a list of cars, trucks, buses and other road vehicles produced today and equipped with Continental engines, together with a sales slogan.

The master list in the corporation's offices contains the names of 91 manufacturers, producing 337 different models under the road vehicle classification.

Mr. Smith listed 82 manufacturers and 255 models. His slogan was "Built to Wear and Win."

Chevrolet Freight Bill $34,805,556 for 1927

DETROIT, March 14 — Chevrolet Motor Co.; bill for shipments to its 14 domestic plants in 1927 aggregated $34,805,556. According to C. R. Scharff, general traffic director of Chevrolet, this covers the movement of 289,575 car loads of freight totaling 5,950,263,608 lb. as well as 208,152,247 lb. of less than car load freight. While the 1927 freight bill was considerably higher than in previous years the proportionate cost per automobile was lower, because of the more than 1,00,000 units built last year, coupled with the efficiency of transportation agencies.

Favorable Action on Pool Purchases Seen by Congress in Present Session

WASHINGTON, March 14—A belief that Congress at the present session will enact the Newton bill (H. R. 8927), which provides for an amendment to the Webb-Pomerene export act and permits pool purchasing of rubber, was expressed this week by Rep. Earl C. Michener, of Michigan, and a member of the House judiciary and rules committees. Passage of the measure, it was testified before the committees, will save the motorists of the country approximately $750,000,000 annually in their rubber bill, as it will prevent a repetition of foreign rubber gouging which in 1925 cost them more than that when rubber rose to $1.25 per pound.

The bill to be considered at all must be especially authorized by both the judiciary committee and the rules committee. The judiciary committee reported it favorably last week and the rules committee is expected to report favorably on the measure next week, thus giving the measure a place on the House calendar. Once on the calendar, it is predicted that the measure will pass as no opposition was voiced to it during the course of two previous hearings and it has been endorsed by the National Automobile Chamber of Commerce, the Rubber Association of America, Inc., and other national organizations.

Half of U.S. Under Uniform Traffic Law

WASHINGTON, March 12—Marked progress toward the solution of the problem of regulating motor traffic in the United States is recorded by A. B. Barber, manager of the department of transportation of the Chamber of Commerce of the United States and director of the National Conference on Street and Highway Safety.

"It has been estimated," he said, "that during 1927 more than 25,000,000 people were brought under new motor laws based on the Uniform Traffic Code, and that taking into account the northeastern states, where the motor laws closely parallel the code, nearly one-half the population of the country comes under traffic laws showing a material degree of uniformity."

The next important step, Colonel Barber points out, is the adoption of uniform municipal ordinances. "Almost important as the uniform code," he says, "is the Model Municipal Traffic Ordinance now in progress.

Hubbard Licenses Kokomo

KOKOMO, IND., March 12—Hubbard Products Co. has licensed the Kokomo Automotive Mfg. Co. to manufacture ventilating eaves under a royalty agreement. The agreement was the outcome of a suit in which the Hubbard patents were upheld. The ventilating eaves will be manufactured by the two companies in the future.

Opens Cleveland Branch

DETROIT, March 12—Detroit Steel Products Co. has opened a factory branch in the Newman Stern Bldg., Cleveland, with S. M. Hathaway as manager.

Coming Feature Issues of Chilton Class Journal Publications

May 3—Sales and Service Reference Number—Motor Age

June 10—A. E. A. Summer Meeting Number—Motor World Wholesale

June 23—Engineering Issue—Automotive Industries

Foreign Trade Convention to Discuss Latin-America

NEW YORK, March 12—The principal theme at the Fifteenth National Foreign Trade Convention to be held in Houston, April 25 to 27, will be trade with Latin America. Business delegations will be present from 10 Latin American countries. A feature of the convention will be a series of nine addresses on the basic factors of export merchandising. A special tour of Mexico arranged by the Federated Chambers of Commerce of Mexico will start immediately after the convention.

To Make Slot Gasoline Pump

PEORIA, ILL., March 11—The Liquid Service Company of America has been incorporated here with $100,000 capital to manufacture an automatic gasoline vending machine, operated by a coin-in-the slot device. Edwin Lehmann is president of the company; Henry J. Wykle, vice-president, and John C. Holtz, secretary. The machine was invented by Mr. Wykle and will undergo 60-day tests in this city before the Ganschow Gear Company, which is building the first machines, will embark upon quantity production.

Los Angeles Show Declared Best Ever

LOS ANGELES, March 12—From an attendance standpoint and from the standpoint of actual sales, the fifteenth annual autmobile show of the Los Angeles Motor Car Dealers Association was pronounced the most successful ever held in this city. Burt Roberts, manager of the show and secretary of the association, estimates that nearly 150,000 persons witnessed the exhibition. The fact that there were two days of the showing with inclement weather makes the attendance record all the more remarkable, as Southern Californians are inclined to stay at home when it rains.

There were 312 passenger cars, 16 heavy trucks and 29 light commercial vehicles displayed, and all distributors expressed themselves as well pleased with the results obtained. In addition to the land-going vehicles, there was an extensive display of airplanes and motor boats. The airplanes especially were the center of great interest by the crowd.

Murray to Use Insulite

DETROIT, March 11—Announcement has been made that the Insulite Co. is actively entering the automotive industry. Their product, an insulating board made up of pressed spruce fiber, has been known in the building trade for 16 years, and is being offered for use in such places in motor cars where insulation boards, as to heat and noise, are an important factor. A production contract has been secured by Insulite from the Murray Corp. of America, which will use it in connection with the rough construction of its all-aluminum bus bodies, and possibly some other parts.

Calendar of Coming Events

SHOWS

American Electric Railway Ass'n, Public Auditorium, Cleveland...Sept. 22-28
American Society for Steel Treating, Commercial Museum, Philadelphia .....Oct. 8-13
Automotive Equipment Association, Coliseum, Chicago .....Oct. 22-27
Berlin .....Nov. 8-18
Brussels .....Dec. 8-19
*Chicago .....Jan. 26-Feb. 2
Geneva .....March 16-25
International Aircraft Show, Berlin, March 23-April 11
Layback, Jugoslavia .....June 2-11
Lille, France .....April 6-22
London, passenger cars .....Oct. 11-20
National Standard Parts Association, Cleveland Auditorium...Oct. 29-Nov. 3
*New York .....Jan. 5-12
Nice .....March 19-31
Oran, Algeria .....April 1-May 31
Paris, passenger cars .....Oct. 4-14
Paris, motorcycles .....Oct. 25-Nov. 4
Paris, trucks .....Nov. 15-25
Prague .....Sept. 1-9
Rio de Janeiro .....May 3-13
Tunis, Tunisia .....April 27-May 6
United States Good Roads Show, Des Moines .....May 28-June 1
Zagreb, Jugoslavia .....April 29-May 6

***Will have special shop equipment exhibit.**

CONVENTIONS

American Electric Railway Ass'n, Public Auditorium, Cleveland...Sept. 22-28
American Gear Manufacturers Association, Hotel Seneca, Rochester, N. Y. .....April 19-21
American Society for Steel Treating, Commercial Museum, Philadelphia .....Oct. 8-13
American Society for Testing Materials, Chalfonte-Haddon Hall Hotels, Atlantic City, N. J. .....June 25-29
American Welding Society, Engineers Society Bldg., New York...April 25-27
Automotive Equipment Association, Grand Hotel, Mackinac Island, June 10-16
Automotive Equipment Association, Coliseum, Chicago .....Oct. 22-27
Chamber of Commerce of the United States of America, Washington May 8-11
National Association of Credit Men, Hotel Olympia, Seattle, Washington .....June 11-16
National Foreign Trade Council, Houston, Texas .....April 25-27
National Hardware Association of the United States, Metal Branch, Copley-Plaza, Boston .....May 3-4
National Safety Council, Central States Safety Congress, Kansas City April 23-25
National Safety Council, National Congress, New York .....Oct. 1-5
National Standard Parts Association, Hollenden Hotel, Cleveland, Oct. 29-Nov. 3
Society of Automotive Engineers, Metropolitan Section, Diesel Engine Meeting .....March 28
Society of Automotive Engineers, Chateau Frontenac, Quebec, June 26-29
United States Good Roads Association and Bankhead National Highway Association, Des Moines. May 28-June 1

A. S. M. E.

Cincinnati, Oct. 22-25—Machine Shop Practice.
Cleveland, Sept. 17-20—Fuels.
Detroit, June 28-29—Aeronautic Division.
Philadelphia, April 23-24—Materials Handling Division, Benjamin Franklin.
Pittsburgh, May 14-17—Spring Meeting.
State College, Pa., June 14-16—Oil and Gas Power.

RACES

Atlantic City .....May 5
Belgium .....Aug. 12
Detroit .....June 3
France .....July 1
Germany .....July 15
Great Britain .....Sept. 22
Indianapolis .....May 30
Italy .....Sept. 2
Spain .....July 29